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National Forest

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# APPENDICES TO FINAL ENVIRONMENTAL IMPACT STATEMENT

Land and Resource Management Plan  
for the Daniel Boone National Forest



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# Appendix A

## SUMMARY OF PUBLIC INVOLVEMENT

Public involvement in development of the Forest Plan revision began in October 1994 with a letter sent to over 2,000 members of the public asking for input to help identify the need to change the Forest Plan. Recipients were asked to identify significant changes in laws, resource conditions and public desires that might warrant making changes to the Daniel Boone Forest Plan.

The need for changes to the Forest Plan was also discussed in April 1995 at a Forest Service interest group meeting attended by representatives from many of the agencies and organizations that have an interest in the management of the Daniel Boone National Forest.

In accordance with 36 CFR 219.6, owners of lands intermingled with or dependent for access upon Daniel Boone National Forest System lands were notified of Forest planning activities along with the general public through notices in the Federal Register, local newspapers, radio/television announcements, and the planning newsletter, *The Boone Planner*, as outlined in the Summary of Public Involvement Activities listed below.

The first issue of the Forest's planning newsletter, *The Boone Planner*, was distributed in June 1996. The purpose of *The Boone Planner* was to introduce interested parties to the forest planning process and keep them updated as the revision process progressed. It would be published periodically throughout the revision of the Forest Plan. Each issue of the newsletter was mailed to those on the forest planning mailing list, which included media; Congressional contacts; local, state, and federal agency representatives; county officials; university personnel; and individuals who had commented or expressed interest in management of the Daniel Boone National Forest. *The Boone Planner* was also placed in Forest Service offices on the National Forest.

The official beginning to the revision of the Daniel Boone Forest Plan began with the publication in the Federal Register of a Notice of Intent to prepare an environmental impact statement on July 21, 1996. A news release was also distributed to area media. This began a 90-day scoping comment period for the public to comment on the need to revise the Forest Plan and the important issues associated with that need. The Notice of Intent described preliminary issues that had been developed from the experience of implementing the Plan for the past 10 years. The preliminary issues included:

- What actions and land allocations are necessary to insure the biological diversity and sustainability of ecosystems, considering the plant, animal and human interactions?
- What combination of land allocation, forest regulations, facilities and services should the national forest furnish to assure public recreation opportunities that provide a minimum of conflict between users and protection of natural resources?
- What road and trail system is needed on the forest and how should it be managed?
- What should be the balance of specially designated areas, such as wilderness, zoological and botanical areas, which are needed to conserve unique forest characteristics?
- Should the Daniel Boone make land allocations and take action to maintain or improve opportunities for hunting and fishing experiences and enjoyment of wildlife?

- What role should timber harvesting play in ecosystem management, and in contributing to meet the demand for wood fiber by the American public? What economic considerations should be applied?
- What additional management options, if any, should be used for the extraction of “miscellaneous forest products” such as moss and other plant material?
- How should the Daniel Boone manage federally owned minerals?

In conjunction with the scoping comment period, a series of open house meetings were held at locations on and off the Forest from July 15, 1996 to August 15, 1996, to provide information on the Forest Plan revision process, the need for a revision and the components of the current Plan that were proposed to change. Members of the core planning team, district rangers, and staff were on hand to answer questions about the Plan revision. The meetings were held at the Laurel County Courthouse in London, KY; McKee City Hall in McKee, KY; Carl D. Perkins Community Center in Morehead, KY; Natural Bridge State Resort Park in Slade, KY; Big Creek Volunteer Fire Department in Big Creek, KY; Whitley City Middle School Cafeteria in Whitley City, KY; Rural Economic Development Center in Somerset, KY; Fayette County Extension Office in Lexington, KY; and Ellis Cooperative Extension Building in Burlington, KY. Total attendance for the ten open houses was approximately 600 people.

By the end of the scoping comment period the Forest had received over 5,000 comments from the public. A content analysis was done to code each comment based on the identified issue. This content analysis was the basis for the final list of 14 significant issues that needed to be addressed in the revision of the Forest Plan.

One of the issues that were identified in many of the scoping comments was the management and use of off-highway vehicles (OHVs) on the Daniel Boone. This was one of the reasons that the Forest Supervisor made the decision to begin work on a Forest Plan amendment, to be completed before the revision of the Forest Plan, which would change management direction pertaining to OHVs. This effort entailed its own set of public involvement initiatives and slowed progress on the Forest Plan revision.

In 1997, the Forest Service initiated another Forest Plan amendment to improve management for a number of species with special habitat needs, and as a response to recent court decisions. This amendment effort was accompanied by its own public involvement strategies.

In August 1998, a workshop was held for citizens to learn more about the national forest planning process and to provide input on alternative management themes that had been developed by the planning team as part of the response to the significant issues. The attendees also provided feedback on what uses the forest should provide and where those uses should occur. The workshop was held at the Carl Perkins Conference Center at Eastern Kentucky University in Richmond, KY. Eighty-six people attended the workshop. Mailings were used to also solicit input from those who could not attend the workshop. Input received at the workshop, from those not attending the workshop, and the original scoping comments was used to modify the alternative management themes and to add new themes.

Beginning in September 2001, the Forest Service began offering an opportunity for members of the public to attend a monthly planning team meeting as a means of learning more about the planning process. Core planning team members provided progress reports and took questions from the attendees.

About this same time the Daniel Boone's forest planning web site was expanded to include more information and documents pertaining to the work of revising the Forest Plan.

A second series of forest planning workshops was held for the public in November and December 2001. The objectives of this set of workshops were to provide participants information about the planning process for revising the Forest Plan and to provide an opportunity for input into the development of management alternatives. Attendees were asked to identify areas of the forest they would recommend be managed to emphasize particular conditions. These workshops were held at Carl Perkins Community Center in Morehead, KY; Clark County Extension Educational Facility in Winchester, KY; Boone County Ellis Extension Center in Burlington, KY; Redbird Ranger District Office in Big Creek, KY; London Community Center in London, KY; Holiday Inn Hurstbourne Parkway in Louisville, KY; and Somerset Community College McCreary Center in Whitley City, KY. Attendance at the workshops totaled 378 and consisted of a wide range of interests. The *Boone Planner* and forest planning web site were used to also seek input from those who could not attend a workshop.

The April 2002 *Boone Planner* recapped the public meetings in the fall and summarized public comments that were received. The public was invited to view these collected comments on the Forest Plan Revision web site and hard copies were available upon request.

In addition to the specific public involvement efforts mentioned previously, the Forest Service has utilized news releases at all of the key phases, including the publication of the Notice of Intent, and to announce each of the public meetings and workshops. Members of the planning team and the Forest Management Team have also made themselves available to speak about the revision process at meetings of various special interest groups.

Several state and federal agencies participated at relevant steps in the revision process (e.g. U.S. Fish and Wildlife Service, Kentucky Department of Fish and Wildlife Resources, Kentucky Division of Water, and Kentucky State Nature Preserves Commission).

Public participation continued with the release of the Draft Environmental Impact Statement and the Proposed Revised Forest Plan. The release of the documents to the public was heralded with a press conference and was formally announced with the publication of a Notice of Availability (NOA) in the Federal Register on May 16, 2003. Publication of the NOA initiated a 90-day comment period.

Public outreach efforts during the 90-day comment period included nine open houses at locations around the national forest and in outlying urban centers, including Lexington, Louisville, and the northern Kentucky/Cincinnati area. The open houses featured information stations where members of the planning team were available to answer questions and explain the planning process and documents.

The public commented on the documents in many different ways. All of the comments were organized and summarized by the Forest Service Content Analysis Team in Salt Lake City. Appendix I is a detailed account of this process, as well as a summary of the public comments, public concerns, and the Forest Service response to these concerns.



Waterfall on Stearns Ranger District

# Appendix B

## DESCRIPTION OF THE ANALYSIS PROCESS

### INTRODUCTION

Appendix B presents a technical discussion of the analysis process and computer models used in the revision planning effort. The appendix focuses on the quantitative methods used to perform the analysis and documents how the analysis was done.

The Forest's major planning goal is to provide enough information to help decision makers and the public determine which combinations of goods, services, and land allocations will maximize net public benefits. The regulations (36 CFR 219) developed under the National Forest Management Act (NFMA 1976) provide the analytical framework within which these decisions are made.

The NFMA and its regulations also state that the requirements of the National Environmental Policy Act (NEPA) and its regulations (40 CFR 1500-1508) must be applied in the analytical process. The NEPA regulations require that the environmental effects of a proposed action and alternatives to that proposed action must be disclosed in an environmental impact statement (EIS).

Information presented in this appendix supplements the broader and less technical descriptions included in the body of the EIS. This discussion includes basic assumptions, modeling components and inputs, rules, methods, and constraints. Additional information and documents used in the analysis process are contained in the planning records. The planning record in its entirety is incorporated here by reference.

The results from the modeling process are estimates of what can be expected if alternatives are implemented and facilitate comparison of alternatives.

### THE 10-STEP PLANNING PROCESS

Land and resource management planning requires that processes formally used to make individual resource decisions be combined into integrated management decisions. It also requires that mathematical modeling techniques be used to identify the most economically efficient solution to meet the goals and objectives of any alternative.

The 10-step process defined in the NFMA regulations was followed. This appendix is concerned with describing the analysis phase of this process, which is steps 2, 3, 4, 5, and 6. Steps 1, 7, and 8 are described in Chapters 1 and 2 of this EIS. Plan implementation (Step 9) and monitoring (Step 10), are discussed in the revised Forest Plan. A brief discussion of the 10-step process follows:

**STEP 1: Identification of Purpose and Need: issues, concern, and opportunities** – The Forest interdisciplinary team assessed changes in public issues, management concerns and resource use and developmental opportunities (ICOS) since the Forest plan was initially developed and subsequently amended. Chapter 1 of the EIS documents this step.

**STEP 2: Planning Criteria** – Criteria are designed to guide the collection and use of inventory data and information, the analysis of the management situation; and the design, formulation, and

evaluation of alternatives. This step establishes guidelines for accomplishing the next five steps. The work plan and other process records document this step.

**STEP 3: Inventory Data and Information Collection** – The kind of data and information needed is determined in Step 2 based on the issues, concerns, and opportunities identified and the resulting assessment of the management situation and determination of what needs to change. Data collection is part of normal forest operations. Existing data is used whenever possible and supplemented with new data, when practicable, if new data will contribute to more responsive analysis. Data accuracy is continually evaluated. Much of this data and background documentation is part of the planning process records on file in the Supervisor's Office.

**STEP 4: Analysis of the Management Situation** - This step consists of assessing the existing situation on the Forest and determining opportunities for resolving issues and concerns. This information provides the basis for formulating an appropriate range of reasonable alternatives. This analysis brings existing information together, puts it into a total Forest perspective, and examines the range of possible situations to resource issues. It examines supply potentials and market assessments for goods and services, and determines suitability and feasibility for meeting needs. Other objectives of the analysis of the management situation include the following:

- Assessing current direction including estimates of goods and services most likely to be provided if current direction is continued.
- Assessing demand for goods and services from National Forest lands.
- Determining if there is a need to change current management direction.

**STEP 5: Formulation of Alternatives** - A reasonable range of alternatives is formulated according to NEPA procedures. Alternatives are formulated to assist in identifying one that comes nearest to maximizing NPB. They provide for the resolution of significant issues and concerns identified in Step 1. The alternatives reflect a range of resource management programs. Each identified major public issue and management concern is addressed in different ways in the alternatives. The programs and land allocations in each alternative represent the most cost-efficient way of attaining the goals and objectives for that alternative. Both priced and non-priced goods and services (outputs) are considered in formulating each alternative.

**STEP 6: Estimated Effects of Alternatives** -- The physical, biological, economical and social effects of implementing the alternatives are considered in detail to respond to the issues and need for change. The Spectrum model estimates some, but not all, of the economic and physical effects. Other effects examined outside the model include ecological and social considerations. The effects of the alternatives are displayed in Chapter 2 and 3 of this EIS.

**STEP 7: Evaluation of Alternatives** - Significant physical, biological, economical and social effects of implementing alternatives are used to evaluate the alternatives and compare them with each other. Typically, each alternative can be judged on how it addresses the significant issues identified in Chapter 1 of the EIS. Chapter 2 of the EIS summarizes the comparisons of the alternatives with the issues.

**STEP 8: Preferred Alternative** - The Forest Supervisor reviews the Interdisciplinary (ID) Team evaluation of each alternative and the public's issues and concerns. The Forest Supervisor then recommends a preferred alternative to the Regional Forester. The Regional Forester either selects the Forest Supervisor's recommendation, another alternative, or modifies the alternative recommended

by the Forest Supervisor. This alternative is described as the preferred alternative in this EIS and is displayed in the Proposed Revised Forest Plan. The Forest Service's preferred alternative is announced in Chapter 2 of the DEIS. Public comments are then solicited and considered in finalizing the revised Forest Plan and EIS.

**STEP 9: Plan Approval and Implementation** - After the ID Team has reviewed the public's comments and incorporated any necessary changes into the EIS or revised Forest Plan, the Regional Forester reviews and approves the Revised Forest Plan and Final Environmental Impact Statement. A Record of Decision (ROD) documents this step.

**STEP 10: Monitoring and Evaluation** - The Revised Forest Plan establishes a system of measuring, on a sample basis, actual activities and their effects, and compares these results with projections contained in the Revised Forest Plan. Monitoring and evaluation comprise an essential feedback mechanism to ensure the Revised Forest Plan is dynamic and responsive to change. Chapter 4 of the Revised Forest Plan displays the Monitoring and Evaluation program.

## **PLANNING CRITERIA (STEP 2)**

The NFMA regulations require planning criteria be developed to guide each step in the planning process. Process criteria are the standard rules and tests to guide and measure the effectiveness of the planning process. Criteria apply to collection and use of inventory data and information; analysis of the management situation; and the design, formulation and evaluation of alternatives.

Planning criteria are based on the following:

- Laws, Executive Orders, regulations and agency policy as set forth in the Forest Service Manual.
- Goals and objectives in the Forest Service Strategic Plan.
- Recommendations and assumptions developed from public issues, management concerns and resource use and development opportunities.
- The plans and programs of other federal agencies, state and local governments and Indian tribes.
- Ecological, technical and economical factors.
- The resource integration and management requirements in 36 CFR. 219.13 through 219.27.

In addition, the Land and Resource Management Planning Handbook (FSH 1909.12) requires the following criteria also be applied:

- Alternatives are technically possible to implement.
- Alternatives meet management requirements or standards.
- Various levels of multiple-use objectives and outputs are achieved.

**INVENTORY DATA AND INFORMATION COLLECTION (STEP 3)**

The ID team, with assistance from resource specialists and district personnel, collected data, maps, graphic material and explanatory aids appropriate for addressing the issues and conducting required analysis. Inventory was done to the detail necessary to support the management decisions to be made.

The following criteria were applied to all elements in the inventory phase:

- 1) Use existing data unless it is inadequate.
- 2) New data and information will be collected on an as needed basis.
- 3) Sources of information and data will be documented in the planning records.
- 4) The Geographic Information System (GIS) system will be used for map storage and manipulation, spatial analysis and generating maps for the Forest Plan.
- 5) The attribute system in GIS will be used when possible to store, manage and display data associated with mapping units.
- 6) Only information stored in GIS will be used to develop capability and management areas for use in the Spectrum scheduling model.
- 7) Where assumptions are used in lieu of specific data or information, the following will occur:
  - a) Identify analytical techniques and associated assumptions used.
  - b) Document why each assumption was used.
  - c) State the basis upon which the analytical techniques and assumptions were selected (identify advantages and disadvantages of each).

**ANALYSIS OF THE MANAGEMENT SITUATION (STEP 4)**

In addition to the emerging issues, the need for change was identified through an analysis of the management situation. This analysis considers results of monitoring, other policy and direction since 1985, the 5-Year Review, the current condition of the resources and supply and demand factors to determine the need for change in management direction, and the ability of the planning area covered by the Forest Plan to supply goods and services. It provides a basis for formulating a broad range of reasonable alternatives. A summary of the major finding of this analysis is located in the *Revised Forest Plan*. The complete Analysis of the Management Situation documents are available at the Supervisor's Office and temporarily through the comment period on the Forest's website ([www.southernregion.fs.fed.us/boone/planning](http://www.southernregion.fs.fed.us/boone/planning)).



## **BUDGET LEVELS ASSUMED FOR EACH ALTERNATIVE**

To develop projected budget needs for each Alternative, several assumptions had to be made. Forest Plan Goals and Objectives can be used to help guide the distribution of budget allocations to individual program areas, such as recreation, wildlife, soil/water/air, etc. However, Forest Plans have little influence over the total budget allocated to a National Forest.

To verify feasibility of Alternatives considered in detail, a total-budget estimate was made for each. This was followed by a determination of the best distribution of program budget allocations to meet the needs and emphases of the various Alternatives. A review of the Daniel Boone's budget allocations for the past 10 years shows that, when adjusted for inflation, allocations changed relatively little. An average of total budget allocations for Fiscal Years 2001 and 2002 was then chosen as the baseline, assuming an increase of no more than 10 percent over the baseline during the first decade of the planning period.

With the maximum increase of 10 percent as a constraint the planning team estimated the difference in total budget that could be expected based on the emphasis of the alternatives. Using the estimated total budget as a constraint, the distribution of funds in budget areas such as recreation, timber and wildlife were estimated. Considerations used in developing these distributions included the Forestwide Goals and Objectives, Prescription Area allocations, projected management activities, and the results generated by the linear program model (Spectrum).

Table B - 1 displays the budget distributions and totals that were assumed for each Alternative.

With four exceptions, program budget projections vary three percentage points or less among Alternatives. The greatest contrast can be seen in the Timber Program, which would account for 12 percent of the total budget in Alternative A. In the "custodial" Alternative, B-1, the Timber Program would consume only 2 percent of the Forest budget. Alternative E-1, the "production" Alternative, Timber would take up 10 percent of the budget, while the other three Alternatives would each account for 9 percent.

For the Wildlife Program budget, the greatest variation between two Alternatives can be found in Alternatives A and B-1, which would account for 7 and 2 percent, respectively. The remaining Alternatives would take up 5 percent, except for Alternative C, which receive 6 percent of the total program budget.

The next greatest budget contrast among Alternatives occurs in the Engineering Program, which would receive 15 percent of the program budget under Alternative B-1 but only 10 percent under Alternatives A, C, and C-1. Alternatives D and E-1 would allocate 11 percent to the Engineering program.

Table B - 1. Estimated Program Budget distributions in thousands of dollars and percent of total by Alternative

Program Area	1985 Forest Plan		Current Forest Plan		Alternative											
	Allocation	% of Total	Allocation	% of Total	A		B-1		C		C-1		D		E-1	
Planning/Inventory/ Monitoring	\$0	0	\$1,009	10	\$1,149	10	\$1,149	12	\$1,149	10	\$1,149	10	\$1,149	10	\$1,149	10
Recreation	\$5,211	25	\$3,277	31	\$3,238	28	\$3,447	35	\$3,447	31	\$3,655	32	\$3,791	33	\$3,551	31
Wildlife	\$781	4	\$564	5	\$836	7	\$209	2	\$627	6	\$627	5	\$522	5	\$522	5
Range	\$29	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0	\$0	0
Timber	\$5,206	25	\$1,010	10	\$1,358	12	\$209	2	\$1,044	9	\$1,044	9	\$1,044	9	\$1,149	10
Soil/Air/Water	\$1,066	5	\$259	2	\$313	3	\$418	4	\$418	4	\$418	4	\$418	4	\$313	3
Minerals	\$696	3	\$289	3	\$313	3	\$209	2	\$313	3	\$313	3	\$313	3	\$627	5
Lands	\$1,355	6	\$367	4	\$418	4	\$313	3	\$418	4	\$418	4	\$418	4	\$522	5
Engineering	\$5,525	26	\$1,141	11	\$1,149	10	\$1,462	15	\$1,149	10	\$1,149	10	\$1,253	11	\$1,253	11
Fire	\$1,104	5	\$2,220	21	\$2,193	19	\$2,089	22	\$2,245	20	\$2,245	20	\$2,245	20	\$2,089	18
Forest Health	\$0	0	\$308	3	\$522	5	\$209	2	\$418	4	\$418	4	\$313	3	\$313	3
Total	\$20,973	100	\$10,444	100	\$11,489	100	\$9,714	100	\$11,228	100	\$11,436	100	\$11,466	100	\$11,488	100

*Note:* The above Budgets reflect average annual allocations for the first decade (in 2000 dollars) expected for the natural resource management program areas, based upon a constrained budget of no more than 10% increase over the planning period. In a given fiscal year the total budget allocation for the Daniel Boone National Forest will also include allocations for such things as law enforcement, quarters maintenance, and fleet equipment. These programs were not addressed in developing the budget distributions for natural resource programs.

## FOREST ACTIVITY SCHEDULING MODEL (SPECTRUM)

This section documents the work associated with the formulation and analysis of the forest activity-scheduling model for the Daniel Boone National Forest<sup>1</sup>.

The forest planning analysis problem can be stated as follows: Given a fixed area of land, what activities should be assigned to each land unit over the next 150 years to achieve the desired future conditions and still meet all physical, operational and regulatory constraints. To do this, the forest land area is divided into smaller homogeneous areas called analysis units. The planning horizon of 150 years is divided into fifteen 10-year periods. A computer program called Spectrum is used to analyze the forest planning alternatives. Spectrum is a decision support model, developed and supported by the USDA Forest Service<sup>2</sup>, which can simultaneously analyze the trade off between the many goals, constraints, management activities, timing options and land types which are necessary to manage a large forest. Spectrum uses a linear program software program called C-Whiz, which in turn uses the Simplex method. The following discussions describe the model formulation, the data used, the activities that are to be applied, differences between alternatives, and some of the results.

Prior to the Spectrum analysis there was considerable work done to prepare data for input to the Spectrum model. This work included: identification of lands tentatively suitable for timber harvest (per 36 CFR 219.14); analysis unit development; timber yield table development; economic information development; management prescription development; and determination of suitable acreage within each alternative. Identification of lands tentatively suitable for timber production and the determination of suitable timberland within each alternative are discussed in chapter 3 (Timber Products).

## DEVELOPMENT OF ANALYSIS UNITS

The Daniel Boone's land base, which is inventoried and tracked in the CISC database<sup>3</sup>, was classified by using the six levels of information summarized in Table B - 2. With these six levels there are 338,688 possible combinations, however, when we overlay the six layers of information on the Daniel Boone National Forest we find that there are 6,537 unique analysis units.

**Table B - 2. Identification Levels used to classify the DBNF land base for analysis**

Level	Description	Number of Categories	Example of code
1	Location by District and watershed	56	Lon-18 – is for London District Watershed 18
2	Access Class	2	Road-cst – is for areas which require additional road construction in order to access
3	Forest type working group	8	XMOG – is for xeric oak stands of good site quality.
4	Age of stand	14	70 – is for stands that are currently 70 to 80 years old.
5	Slope	2	Logcst – is for areas that are greater than 40% slope.
6	Administrative classification	12	BAT – areas with significant bat caves buffered with a one-mile radius.

<sup>1</sup> Primary author: Dr. Joseph P. Roise of North Carolina State University.

<sup>2</sup> Forest Management Service Center, Fort Collins, CO.

<sup>3</sup> Continuous Inventory of Stand Conditions (CISC) database, version 4.02, January 1997.

Table B - 3 displays the acreages in each level one category (district and watershed combinations). These areas are important because they can be easily located on the forest. The other five level identifiers, while they can be located on the forest, are not as easy to locate. This is because they are not necessarily contiguous land areas.

**Table B - 3. Level 1 identifiers – Location on the DBNF by District<sup>1</sup> and watershed**

Level 1 Identifier	Acres	Level 1 Identifier	Acres	Level 1 Identifier	Acres	Level 1 Identifier	Acres
lon-13	2,415	mor-0	85	som-29	11,105	ste-37	3,976
lon-14	19,500	mor-2	34,568	som-33	2,124	ste-38	19,968
lon-15	918	mor-3	14,856	som-36	20,579	ste-41	18,579
lon-17	6,044	mor-4	27,262	som-37	11,509	ste-42	3,839
lon-18	5,895	mor-5	10,013	som-38	11,919	ste-43	10,361
lon-19	14,589	mor-6	15,434	som-39	10,189	ste-44	10,098
lon-20	24,072	mor-7	1,962	som-41	18	ste-45	15,929
lon-23	5,419	red-21	14,031	sta-10	8,462	ste-46	24,163
lon-24	996	red-22	3,814	sta-11	1,966	ste-47	1,494
lon-29	20,208	red-25	9,579	sta-12	4,078	ste-48	1,802
lon-32	10,015	red-26	6,381	sta-13	1,180	ste-49	1,184
lon-34	11,671	red-27	20,206	sta-16	309		
lon-35	15,857	red-28	74,986	sta-6	127		
lon-37	20,647	red-30	105	sta-8	30,037		
lon-40	4,333	red-31	12,522	sta-9	1,435		

<sup>1</sup> Districts are abbreviated as:

lon = London Ranger District

mor = Morehead Ranger District

red = Redbird Ranger District

som = Somerset Ranger District

sta = Stanton Ranger District

ste = Stearns Ranger District

The next set of identifiers (Level 2) is for areas that need additional access roads for activities to take place and those that do not need additional access roads.

**Table B - 4. Level 2 identifiers - Access class for lands on the DBNF**

Level 2 Identifier <sup>1</sup>	Description	Acres
<b>None</b>	Needs no additional road construction for access.	382,173
<b>rd-cst</b>	Needs additional road construction for access.	252,640

The Level 3 identifiers (Table B - 5) are for forest type working group and in the case of oak types, some information about site productivity is maintained.

**Table B - 5. Level 3 identifiers - Forest type groups found on the DBNF**

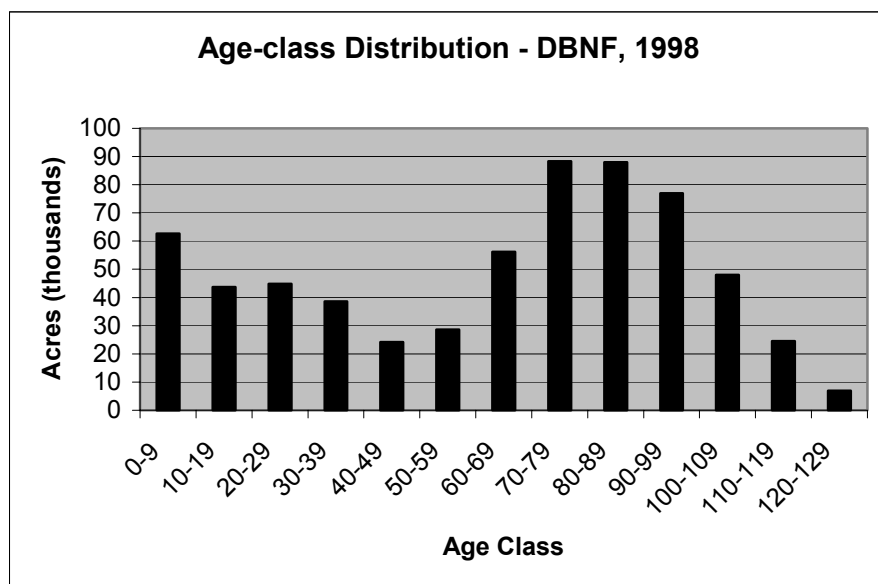
Level 3 Identifier	Description of Type	Acres
<b>BUG47</b>	Pine with heavy southern pine beetle damage	36,695
<b>BUG53</b>	Pine-hardwood with southern pine beetle damage	55,418
<b>MM-F</b>	Mixed mesophytic forest	158,837
<b>O-YP</b>	Oak - yellow pine (stands having 30-49% pine)	58,526
<b>P-PO</b>	Pine and Pine-oak (stands having 50-100% pine)	1,210
<b>WP-H</b>	White pine and hemlock	24,985
<b>XMOG</b>	Mesic oak, good site quality	24,217
<b>XMOP</b>	Xeric oak, poor site quality	274,925

The Level 4 identifier is for the age of the forest stands (Table B - 6). The current age class distribution plays an important roll in what can be achieved on the forest during the next several decades. Note the large acreage in the “0” (0-9) age-class. Just over 40,000 acres of this is pine forestland damaged by the southern pine beetle. This southern pine beetle attack will affect the forest structure and environment for years to come. **Figure B - 1** next to the table is a graphic display of the 1998 age-class distribution, adjusted for the loss of pine due to the pine beetle outbreak in 2000 and 2001.

**Table B - 6. Level 4 identifier – Stand age for stands within the DBNF**

Level 4 Identifier	Age Description <sup>1</sup>	Acres
<b>0</b>	0 thru 9	62,660
<b>10</b>	10 thru 19	43,708
<b>20</b>	20 thru 29	44,779
<b>30</b>	30 thru 39	38,536
<b>40</b>	40 thru 49	24,125
<b>50</b>	50 thru 59	28,578
<b>60</b>	60 thru 69	56,170
<b>70</b>	70 thru 79	88,304
<b>80</b>	80 thru 89	87,938
<b>90</b>	90 thru 99	76,975
<b>100</b>	100 thru 109	47,994
<b>110</b>	110 thru 119	24,473
<b>120</b>	120 thru 129	6,889
<b>130</b>	130 and up	3,684

<sup>1</sup> In years



**Figure B - 1. Age Class Distribution**

The Level 5 identifier is for slope class (Table B - 7). The major effect of slope in the analysis model is to adjust logging costs when the ground gets steeper.

**Table B - 7. Level 5 identifier – Slope class for lands within the DBNF**

Level 5 Identifier	Description	Acres
<b>logcst</b>	Slopes greater than or equal to 40%	65,194
<b>none</b>	Slopes less than 40%	569,619

The Level 6 identifiers are for those Prescription Areas that are unsuitable for timber production. Various combinations of these were used, based on the Prescription Areas assigned to each alternative as shown in Chapter 2. Some of these areas, such as the administratively withdrawn land classes, are excluded from timber production in all alternatives.

**Table B - 8. Level 6 identifiers – Administrative classification**

Level 6 Identifier	Description	Acres
<b>Bats</b>	Significant bat cave areas buffered with a one mile radius	4,907
<b>Cliff</b>	Cliffline when not located within another level 6 identifier	56,259
<b>Grouse</b>	Ruffed grouse emphasis Area	9,309
<b>NASA</b>	Natural Arch Scenic Area	1,055
<b>NONE</b>	Not classified in other areas.	440,343
<b>OLDGRO</b>	Designated old-growth and potential old-growth forests	16,721
<b>PotWSR</b>	Potential Wild Scenic River	12,309
<b>PRNAEL</b>	Potential research natural area Elijah Branch	330
<b>PRNATH</b>	Potential research natural area Tight Hollow	308
<b>RIPARI</b>	Riparian when not located within other level 6 identifier, except cliff	70,932
<b>SubRRG</b>	Red River Gorge Geological Area	15,343
<b>Swap</b>	Source water protection level 1	5,412
<b>WSRREC</b>	Red River Gorge/Potential Wild Scenic River	1,585

## DEVELOPMENT OF TIMBER STAND GROWTH AND YIELD TABLES

There were several steps involved in building the growth and yield tables for the Forest. The first step was to stratify stand polygon data from the Forest's CISC database using groupings of forest types (Table B - 1), stand age, and productivity class to determine what tables would be the most useful. Since detailed stand inventory data is not available within the CISC database, the second step was to find plot data that could be correlated with the attributes available in CISC.

Under the authority of several acts including the McSweeney-McNary Forest Research Act of 1928, the Forest Service conducts periodic forest inventories of all states including Kentucky. The Forest Inventory and Analysis (FIA) program has the responsibility to collect, maintain, and provide

required analysis of this data. Sample plot data collected by the FIA includes individual tree information such as tree height, diameter, and species. Each plot is assigned a forest type, age, and other site information that happens to correlate well with the Forest's CISC stand polygon data. However, before FIA data could be used, a reasonable sample area and number of plots had to be selected for each stratum. Once the plots were selected and stratified, using the same groupings described above for the CISC stand data, a set of statistics such as the coefficient of variation was computed for each data set. This analysis was accomplished through the use of the PreSuppose computer program.

### **PreSuppose**

Pre-Suppose is a program developed by the Forest Management Service Center (FMSC)<sup>4</sup> to query and sort Forest Inventory and Analysis (FIA) data. The FIA data was first reformatted by the FMSC to be compatible with PreSuppose. As the data is sorted, the program prepares a "locations" file and a "stand list" file needed for the next step of analysis (the Suppose program).

The original thought was to use just plots from National Forest for both Cumberland Plateau and Mountains; however, a sufficient sample was not available, so plots on private lands were used as well. On examination, plots from private and National Forest lands usually had very similar diameter and volume characteristics for the same forest type, age and site class.

Forest Inventory & Analysis (FIA) data that was converted to an FVS-ready format was downloaded, extracted, & setup for Kentucky & Tennessee (Cumberland Mountains & Plateau). The 5th survey Virginia (northern Piedmont) data was also downloaded, extracted, and setup later on as it became evident that Kentucky or Tennessee data was lacking in some stratifications.

### **Suppose**

*Suppose*<sup>5</sup> is the graphical user interface (GUI) for the Forest Vegetation Simulator (FVS). *Suppose* permits proposed management plans or policies to be entered into the FVS system, using methods more directly related to forest management than directly using the FVS input system (keywords). The program provides tools allowing use of FVS without knowing the FVS keyword language or remembering the details of keyword usage. *Suppose* also provides an evaluation platform that can be used to gather user feedback for the designers of the system.

*Suppose* simulates changes in forest vegetation over a long time span (100-400 years) for a stand or group of selected stands. The program can process from 1 to about 1,000 forest stands. *Suppose* accomplishes the simulation by creating an input file used by the Forest Vegetation Simulator (FVS) and by then starting the appropriate FVS program that reads and processes the input file. The program contains the desired geographic variant and extensions to the base FVS system. However, FVS, not *Suppose*, actually accomplishes the simulation.

The output from *Suppose* is a simulation file interpreted by FVS as a keyword file. This file is read by FVS, along with the tree-level inventory data, for FVS to make the projection.

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<sup>4</sup> Forest Management Service Center (FMSC), a sub-unit of the Forest Service's Washington office, located at Fort Collins, CO.

<sup>5</sup> *Suppose* was developed by Nicholas L. Crookston, of the Rocky Mountain Research Station's Forestry Sciences Laboratory <<http://forest.moscowfs.l.wsu.edu/>>.

### **Forest Vegetation Simulator (FVS) Model**

The primary tool used for building time-based yield tables, which are then used in the Spectrum model, is the Forest Vegetation Simulator model (FVS). FVS is an individual-tree, distance-independent, growth and yield model. It is based on the Stand Prognosis Model<sup>6</sup>. The team at the USFS Forest Management Service Center in Fort Collins has now calibrated sixteen additional variants of the model to specific geographic areas throughout most regions of the United States.

FVS allows the user to calculate estimates of forest stand structure and species composition over time and quantify this information to (1) describe current and future forest stand conditions, (2) simplify complex concepts of forest vegetation into user-defined indices, attributes, etc., and (3) allow the manager to ask better questions about growth and yield of forest stands and complete analyses to answer those questions.

The FVS model structure contains modules for growing trees; predicting mortality; establishing regeneration; simulating growth reductions, damage, and mortality due to insects and disease; performing management activities; calculating tree volumes; and producing reports. One of the strengths of the FVS system is its ability to incorporate local growth rate data directly into the simulation results.

Growth rates for common species on FIA plots were compared to growth rates generated by FVS. Also, volume information from past timber sales on the DBNF was compared to yields generated by FVS. The information obtained from these comparisons was used to calibrate FVS.

For mature to advanced stand ages, FVS tended to under-predict mortality and over-predict growth for most forest/community types. To correct this tendency, growth coefficients were decreased and mortality coefficients were increased for most species at ages 65 and above, and then again for ages 100 and above.

Yields were developed for each analysis area under scenarios for different regeneration harvest methods and for thinned and un-thinned conditions. FVS reported projected yields for each product class at 10-year intervals. These yields were then used to build the yield tables for the Spectrum model.

### **SPECTRUM – COSTS AND REVENUES OF MANAGEMENT ACTIONS**

The associated costs of activities such as stand regeneration, stand improvement and timber harvesting used in the Spectrum model to create various vegetative conditions are summarized in Table B - 9. Such activities may occur only when certain conditions are met. These conditions are displayed in the table. Regeneration and other silvicultural costs were estimated from historic records such as KV plans; a regional logging engineer estimated cable-logging costs; and the Forest transportation planner estimated road costs, based on an average timber road (service level D, maintenance level 1). Revenues of the timber program are based on the stumpage prices received by the Forest from 1990 to 1995, which are shown in Table B - 10. All costs and revenues were adjusted to 2000 dollars, based on the Gross National Price Deflator. A four percent discount rate was assumed within Spectrum.

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<sup>6</sup> The Prognosis Model developed by Albert Stage at the Intermountain Research Station.



**Table B - 9. Spectrum Analysis – Costs of management actions, and conditions where applied**

Management Action	Conditions where applied		Costs				
	Level Identifier-code <sup>1</sup>	Age of Stand at Which Action is Initiated	Sale Preparation and Administration cost/ mcf <sup>2</sup>	Regeneration cost/acre	Additional Logging Cost per mcf for areas with >40% slope	Road Construction (areas >1/4 mile from roads) cost/acre	Savannah/Woodland burning costs/acre
<b>Create Canebrakes</b>	6-Riparian	Any age less than 20	\$280	\$240			N/A
<b>Create Hardwood wooded grassland</b>	3-HDWD <sup>3</sup> , 6-none	Age 60 and up			\$170	\$190	\$40 (3 times during the first decade, 2 times during all others)
<b>Harvest to residual 15 BA</b>	6-none	100 years plus	\$280	Pine - \$410 Others- \$140	\$170	\$190	
<b>First thinning to 40 BA residual</b>	4-less than 70; 6-none	Thin at 80; Do not harvest	\$280	Pine - \$410 Others- \$140	\$170	\$190	\$40 (3 times during the first decade, 2 times during all others)
<b>Second thinning 40 BA residual</b>	6-none	Thin at 140	\$280	Pine - \$410 Others- \$140	\$170	\$190	\$40 (3 times during the first decade, 2 times during all others)
<b>First thinning to 60 BA residual</b>	6-none	Thin at 80	\$280	Pine - \$410 Others- \$140	\$170	\$190	
<b>Second thinning to 60 BA residual</b>	6-none	Thin at 140	\$280	Pine - \$410 Others- \$140	\$170	\$190	
<b>Pine savannah</b>	6-none, 3-pine lands	70 to 140	\$280	Pine - \$410 Others- \$140	\$170	\$190	\$40 (3 times during the first decade, 2 times during all others)
<b>Shrub-sapling openings</b>	6-none	Any age less than 20	\$280	\$140 each decade	\$170	\$190	
<b>No active management</b>	Available to all Analysis Units		No direct costs applied				

<sup>1</sup> See Tables B-4, B-5 and B-7 for a summary of codes used.<sup>2</sup> Thousand cubic feet<sup>3</sup> Hardwood

**Table B - 10. Timber stumpage prices used in the Spectrum analysis**

Appraisal Group						
Group Name	Top Value Hardwood	High Value Hardwood	Mid Value Hardwood	Mid Value Pine	Low Value Hardwoods	Pulpwood-size
Code	TVH	HVH	MVH	MVP	LVH	PTS
Example Species	Red Oak, Cherry	White Oak	Tuliptree, Basswood	Pine	Scarlet Oak	(Hardwood & Pine)
Price / CCF	\$125	\$97	\$42	\$40	\$16	\$5

## SPECTRUM – BENCHMARK RUNS

As a part of the Analysis of the Management Situation, benchmark runs are required to be run to define the range within which alternatives can be constructed (CFR219 (e)(1)). The “Current Management” benchmark required by CFR219.12 (e)(2) is Alternative A, which is displayed in Table B - 13. Three benchmark runs were made to show how much the forest could produce of a single objective without being constrained by other objectives (Table B - 11). These three runs were:

- Maximize net present value without a non-declining yield (NDY) constraint.
- Maximize net present value (NPV) with non-declining yield constraint in place.
- Maximize allowable sale quantity (ASQ) with non-declining yield constraint in place.

The Minimum Level Benchmark is “the minimum level of management which would be needed to maintain and protect the unit as part of the National Forest System together with associated costs and benefits” (36 CFR 219.12(e)(1)(i)). This benchmark is the same as alternative B, which is described in chapter two under the heading of Alternatives Considered but Eliminated.

**Table B - 11. Spectrum Benchmark Runs, by NPV, ASQ, and LTSY**

Benchmark Run	NPV (\$ 1998)	ASQ (mcf/decade)	LTSY (mcf/year)
<b>Maximize NPV without NDY</b>	\$23,717,747	N/A	2,698
<b>Maximize NPV with NDY</b>	\$23,429,532	50,817	5,082
<b>Maximize ASQ with NDY</b>	\$6,937,847	53,175	5,318
<b>Minimum Level</b>	\$0	0	0

NPV=net present value, ASQ=allowable sale quantity, LTSY=long-term sustained yield, NDY=non-declining yield

**Table B - 12. Spectrum Benchmark Runs, harvest per decade (thousand cubic feet)**

Benchmark Run	Decade											
	1	2	3	4	5	6	7	8	9	10	11-14	15
<b>Maximize NPV with non-declining yield</b>	50,817	50,817	50,817	50,817	50,817	50,817	50,817	50,817	50,817	50,817	~	50,817
<b>Maximize NPV without non-declining yield</b>	58,422	35,796	57,005	61,840	65,157	0	0	0	21	7,251	~	7,675
<b>Maximize ASQ with non-declining yield</b>	53,176	53,176	53,176	53,176	53,176	53,176	53,176	53,176	53,176	53,176	~	53,176
<b>Minimum Level</b>	0	0	0	0	0	0	0	0	0	0	0	0

### SPECTRUM – ALTERNATIVE RUNS

Each of the six alternatives was analyzed using the Spectrum modeling system. Each alternative had a specific set of objectives. All alternatives had a non-declining yield constraint applied over a 150-year planning horizon. All alternatives had a maximum budget constraint based on 110% of existing budget. The new riparian prescription was applied to all alternatives except Alternative A. Each alternative had a specific level of southern yellow pine restoration. To set this level for each alternative, the maximum amount of pine restoration subject to the different alternative constraints was estimated. Once determined, the alternative specific level of pine restoration was then set as a constraint. A multiple goal objective function was used. Instead of maximizing a certain objective, acre objective goals were set with a priority levels assigned to each goal.

**Alternative A** was formulated to mimic a schedule of management activities that most likely would be applied if the current plan were applied without change. With the existing plan emphasis on the red-cockaded woodpecker habitat management, the main objective of Alternative A was southern yellow pine restoration. In areas that were almost completely deforested by the southern pine beetle infestation, the minimum number of acres reforested in southern yellow pine the first decade was 20,000 acres. There were no uneven age, savannah, or woodland management areas in the current plan and therefore there were none in Alternative A. Harvest entries were designed to approximate 70-120 year rotations as directed in Amendments 6 and 8 of the Plan. In order to create these rotation ages, 6088 acres of pine were scheduled for harvest each decade following the 10<sup>th</sup> decade and 7520 acres following the 13<sup>th</sup> decade. The first priority was harvest acre goals for the different stand types (pine oak, mesic and xeric oak, mixed mesophytic and white pine). Thinning levels in the four management areas were the second priority goals in Alternative A.

**Alternative B-1** was formulated to represent a schedule having a minimum amount of vegetation management based on minimum needs for viability of plant and animal species. The number of southern yellow pine restoration acres was maximized subject to a limit of 4,633 acres each of the first 8 decades with no pine restoration occurring after the 8<sup>th</sup> decade. The first priority in Alternative B included a harvest level between 7,000 and 7,700 acres each decade and the minimum amount of uneven age and shrub-sapling openings required. The second priority included various

thinning levels in the four management areas and the creation of a minimum level of pine and hardwood woodland and canebrake management area acres. The last priority was the creation of a minimum number of pine and hardwood savannah management areas.

**Alternatives C, C-1, & D** were formulated to best meet species viability and biodiversity goals along with various levels of recreation. These desires were simulated in Spectrum by varying the maximum budget amounts available for vegetation management. An assumption was made that with a total forest budget cap for all alternatives, as recreation funding increases from Alternative C, C1, to D respectively, vegetation management funding would decrease. The constraint for the minimum level of southern yellow pine restoration was 8,000 acres in the first three decades. There was also a constraint eliminating from harvest for the entire planning horizon all stands that are currently older than 120 years of age. The first priority included a harvest level between 16,875 and 20,625 acres each decade of the planning horizon, and a certain amount of shrub-sapling opening and uneven age management areas. The second and third priority levels included the same management actions as Alternative B1 with higher acreage goals for each management action.

**Alternative E-1** was formulated to allow a high level of timber products output, while incorporating the new riparian management strategy. Goals and constraints were set to simulate an approximate rotation length of 100 years for all species. The minimum viability requirements were the same as those used in Alternative B1. The first priority in Alternative E1 was a harvest level between 36,364 and 44,000 acres each decade.

The following Table B - 13 displays some important results from alternative runs. More detailed information is displayed in Chapter 3 – Analysis of Alternatives, Timber Products.

**Table B - 13. Spectrum Analysis Results - Allowable sale quantity (ASQ), long-term sustained yield (LTSY), and net present value (NPV) by Alternative**

	Alternatives					
	A	B-1	C	C-1	D	E-1
<b>ASQ for first decade (MCF<sup>1</sup>)</b>	40,899	5,072	21,665	21,924	21,504	44,851
<b>LTSY (MCF/ year)</b>	5,300	1,176	3,976	3,973	3,915	5,700
<b>Decade LTSY achieved</b>	4th	13th	8th	8th	9th	15th
<b>NPV</b>	\$10,830,668	-\$3,546,403	-\$3,588,943	-\$3,468,237	-\$3,275,232	\$12,018,682

<sup>1</sup> MCF = thousand cubic feet

## FOREST TYPE GROUPINGS

**Table B - 14. Grouping of Forest Type\* by Community Type and Analysis Source**

Community Type	Old-Growth Analysis	Viability Analysis	Spectrum Analysis
Conifer/N. Hdwd.	3,4,5,8,9,10	8,9,10,42	
W. Pine/Hemlock		3,4,5	3,4,5,8,9,10
Mixed Mesophytic	41,50,56,81	41,50,56,81	
Mixed Mesophytic/Floodplain			41,50,56,58,61,71,72,74,75,81,82,88
River Floodplain Hdwd.	46,58,71,72,75	Riparian Assoc.	
Eastern River Front	74,82	Riparian Assoc.	
Dry-Mesic Oak	42,51,52,53,54,55	51,53,54,55	
Xeric-Mesic Oak			42,43,51,52,53,54,55,59,60
Dry-Xeric Oak	43,52,59,60	52,59,60	
Dry-Xeric Cedar Oak		11,35,43	
Mixed Oak/Yellow Pine			44,45,46,47,48
Dry-Mesic Oak-Pine	31,44,45,47,48		
Dry-Xeric Mixed Pine & Oak		16,45	
Dry-Mesic Mixed Pine & Oak		12,13,15,44,46,47,48	
(Xeric)Pine & Pine-Oak	12,13,15,16,20,32,33,38		11,12,13,15,16,17,31,32,33,35,38
Yellow Pine		31,32,33,38	

**\*Table B - 15. Forest Type Codes used on the Daniel Boone National Forest**

CISC Code	CISC Forest Type	CISC Code	CISC Forest Type
03	White Pine	50	Yellow-poplar
04	White Pine-Hemlock	51	Post Oak- Black Oak
05	Hemlock	52	Chestnut Oak
08	Hemlock-Hardwood	53	White Oak- Northern Red Oak- Hickory
09	White Pine-Cove Hardwood	54	White Oak
10	White Pine-Upland Hardwood	55	Northern Red Oak
11	Eastern Redcedar-Hardwood	56	Yellow-Poplar/ White Oak/ Northern Red Oak
12	Shortleaf Pine-Oak	57	Scrub Oak
13	Loblolly Pine-Hardwood	58	Sweetgum- Yellow-poplar
15	Pitch Pine-Oak	59	Scarlet Oak
16	Virginia Pine-Oak	60	Chestnut Oak- Scarlet Oak
31	Loblolly Pine	63	Sugarberry-American Elm-Green Ash
32	Shortleaf Pine	70	Black Cherry
33	Virginia Pine	71	Black Ash-American Elm-Red Maple
35	Eastern Redcedar	72	River Birch-Sycamore
38	Pitch Pine	73	Cottonwood
41	Cove Hardwoods-White Pine-Hemlock	74	Willow
42	Upland Hardwoods-White Pine	75	Sycamore-Pecan-American Elm
43	Oak-Eastern Redcedar	76	Silver Maple-American Elm
44	Southern Red Oak-Yellow Pine	81	Sugar Maple-Beech-Yellow Birch
45	Chestnut Oak-Scarlet Oak-Yellow Pine	82	Black Walnut
46	Bottomland Hardwood-Yellow Pine	83	Black Birch
47	White Oak-Black Oak-Yellow Pine	88	Black Locust
48	Northern Red Oak- Hickory- Yellow Pine		

## **SELECTION OF MANAGEMENT INDICATOR SPECIES (MIS)**

National Forest Management Act (NFMA) regulations adopted in 1982 require selection of management indicator species (MIS) during development of forest plans (36 CFR 219.19(a)). Reasons for their selection must be stated, and this document describes the process and rationale used to select MIS for the DBNF's 2004 Land and Resource Management Plan. Monitoring of MIS populations must be feasible as well meaningful and comply with relevant statutes, regulation, and case law, including recent court rulings.

Management indicator species (MIS) are to be selected "because their population changes are believed to indicate the effects of management activities" (36 CFR 219 (a)(1)). They are to be used during planning to help compare the likely effects of alternatives (36 CFR 219.19(a)(2)), and as a focus for monitoring (36 CFR 219.19(a)(6)). Where appropriate, MIS are to represent the following types of species (36 CFR 219 (a)(1)):

- a) Threatened and endangered species on state and federal lists
- b) Species with special habitat needs
- c) Species commonly hunted, fished, or trapped
- d) Non-game species of special interest
- e) Species selected to indicate effects on other species of selected major biological communities.

Since adoption of MIS regulations, the scientific community has critiqued and refined the management indicator species concept (Caro and O'Doherty 1999, Simberloff 1998, Noss 1990, Landres et al. 1988, and Weaver 1995). These analyses have identified more appropriate uses as well as some limitations of the MIS concept. Critical reviews generally caution against overreaching in the use of indicator species, especially when making inferences about ecological conditions or the status of other species within a community. Caution is advised because diverse factors affect populations of each species within a community, and each species' ecological niche within a community is unique.

To reflect this current scientific understanding while meeting the letter and spirit of regulations, the DBNF has made great effort to clearly define the legitimate uses and limitations of each MIS. The MIS model is but one tool for developing management strategies and monitoring programs that fulfill NFMA requirements to promote diversity of plant and animal communities. Other means used in comprehensive planning for plant and animal diversity include:

- a) Management objectives and standards for maintenance and restoration of desired ecological conditions based on knowledge of overall ecosystem structure and function
- b) Biological evaluations and assessments at both the forest plan and site-specific project levels
- c) Evaluations of risk to species of viability concern at the forest plan level.

Additional elements useful for monitoring the effects of plan implementation on plant and animal diversity include, where appropriate, the monitoring of:

- a) Key ecological conditions
- b) Levels of management activities important to restoration and maintenance of community diversity

- c) Species assemblages (birds, bats, fish, etc.)
- d) Harvest levels of game and other demand species
- e) Populations and/or habitats of threatened, endangered, and sensitive species.

## MIS SELECTION

Consideration of MIS for the 2004 Forest Plan started with the current list of MIS (Table 1) and the most recent results of population monitoring and evaluation (USDA Forest Service 2001b). The planning staff also reviewed region-wide lists of MIS identifying opportunities for use of common MIS for common purposes. Additional species were considered under each of the five categories of potential MIS identified in 36 CFR 219.19(a)(1). All species considered were assessed using the following criteria to determine their appropriateness as MIS:

- a) Changes in the species' population should primarily reflect the effects of national forest management activities
- b) Population trends of the species must be capable of being effectively and efficiently monitored and evaluated.

**Table 1. Management Indicator Species selected for use in the DBNF's 1985 Forest Plan and primary reason(s) for their original selection.**

Common Name	Scientific Name	Primary reason(s) for original selection
White-tailed Deer	<i>Odocoileus virginianus</i>	Ecological indicator; Game species
Eastern Bluebird	<i>Sialia sialis</i>	Ecological indicator
Rufus-sided (Eastern) Towhee	<i>Pipilo erythrophthalmus</i>	Ecological indicator
Eastern Gray Squirrel	<i>Sciurus carolinensis</i>	Ecological indicator; Special needs; Game species
Red-cockaded Woodpecker	<i>Picoides borealis</i>	Ecological indicator; Special needs; T&E species
Pileated Woodpecker	<i>Dryocopus pileatus</i>	Ecological indicator; Special needs
Blackside Dace	<i>Phoxinus cumberlandensis</i>	Ecological indicator; T&E species
Arrow Darter	<i>Etheostoma sagitta</i>	Ecological indicator
Fantail Darter	<i>Etheostoma flabellare</i>	Ecological indicator
Rainbow Darter	<i>Etheostoma caeruleum</i>	Ecological indicator
Brindled Madtom	<i>Noturus miurus</i>	Ecological indicator
Stone Roller	<i>Campostoma anomalum</i>	Ecological indicator
Smallmouth Bass	<i>Micrpterus dolomieu</i>	Ecological indicator; Games species

Before examining the suitability of individual species as MIS, some general observations about some species groups can be made.

**Migratory Birds:** Many migratory bird species often serve as MIS during the first round of forest plan development. They have been retained and even highlighted as MIS in some recent plan revisions and amendments in the Southern Region. Their retention or prominence as MIS has been based on the following characteristics:

- a) Many are very specific in their habitat relationships, being tied very closely to specific vegetation composition or structure
- b) Many are common and widespread in suitable habitats, facilitating monitoring of population responses
- c) They can be monitored relatively effectively using standardized protocols currently in use on all national forests, and
- d) Relatively good information is available on regional and range-wide population trends, which can be used to put national forest data into context.

Their migratory habits, however, lead these species to spend a significant portion of their lives off of national forest land where they may be subject to many other factors that may affect their population trends.

Consideration of migratory birds for MIS selection, therefore, must include a balanced view of these positive and negative characteristics. Where other species are available and more appropriate for meeting the identified purpose, they should be selected over migratory birds. Where migratory birds are the best species available, they may be selected if limitations to, and strategies for, population monitoring and evaluation are clearly considered.

There are opportunities to isolate the effects of national forest management from other effects by comparing trends occurring on national forest system land with those occurring on a broader scale. Stable or increasing trends observed on national forests while broader trends are decreasing would indicate positive effects of national forest management, and vice versa. Similar trends documented at national forest and broader scales, regardless of their direction, would suggest broader scale factors are prevalent. Additional limitations on monitoring bird trends have been previously documented (Gaines and Morris 1996, Linder and Buehler 2002).

At current levels of funding, it is not feasible to monitor enough bird points to document trends at an individual national forest scale with high levels of statistical precision. Current strategies are designed to document trends across national forests at ecoregional scales. While not ideal, this approach will still allow assessment of national forest management effects, especially where such management is similar across forests within an ecoregion, as is the case in the Southern Appalachians and the Piedmont. In addition, other methods of analyzing data, such as looking at habitat associations and frequency of occurrence within indicated habitats, can shed light on a species' response to management actions on a more local scale. DBNF planners believe this meets the intent of regulations that MIS be used to indicate the effects of management on wildlife resources.

**Herps:** Most amphibians and reptiles do not meet the criteria of appropriate MIS because they often require a sampling effort beyond the DBNF's current capability. Amphibians can be particularly difficult to monitor due to the high sampling variability (Hyde and Simons 2001). The inability to



count them with precision makes inferences on relationships between population trends and habitat changes difficult and unreliable. The Forest Service is working closely with cooperators to improve, develop, and standardize survey protocols for both amphibians and reptiles so that effective monitoring programs can be established and expanded. However, at this point, inherent limitations to monitoring this group make them generally ineffective as MIS.

**Plants:** Plants can serve as effective indicators of specific habitats and conditions. Many are well documented for their responsiveness to forest management activities, both positive and negative. Species that are fire-dependent, or highly associated with specific successional stages, can be particularly effective as MIS. Plants are often capable of being effectively monitored due to their immobility. The monitoring precision necessary varies with purpose of the MIS selection, but in many cases high precision is not needed to show population response to management activities. Additionally, while many plants often appear to be good indicators of specific conditions, they do not always occur where expected, an indication that other unknown factors may be at work. However, monitoring of overall plant community composition often provides better information on management effects than focusing on one or just a few species.

**Terrestrial Invertebrates:** Terrestrial invertebrates are generally deemed inappropriate as MIS because monitoring protocols are not well developed for most species, and little is known of their habitat relationships. Their populations also tend to fluctuate widely due to unknown factors.

The remainder of this section documents consideration of the appropriateness of species as MIS by category as listed at 36 CFR 219 (a)(1).

## THREATENED AND ENDANGERED SPECIES

Species within this category are identified as threatened or endangered on state or federal lists. They are selected to focus attention on species with viability concerns whose population levels are directly tied to effects of national forest management. These species already receive attention during planning and monitoring by virtue of their status under the Endangered Species Act, Forest Service sensitive species policy, and NFMA viability regulations. Therefore, designation of species from this category for coverage by MIS requirements is in many ways redundant. Our consideration of MIS status for species within this category was focused on identifying those species whose population trends and continued existence are especially dependent on national forest management activities.

**Bats:** The most high-profile bat species in this category are the Indiana bat (*Myotis sodalis*), gray bat (*Myotis grisescens*), and Virginia big-eared bat (*Corynorhinus townsendii virginianus*). Populations of these species benefit from national forest management, which provides protection of caves used for roosting and hibernation. Bat population monitoring within these caves is currently conducted. However, because bat populations disperse widely (beyond national forest boundaries) during non-hibernation seasons, little is known about their movements or the factors limiting populations. Changes in populations documented through cave counts reflect all of these other factors, some of which are not necessarily associated with national forest management. In addition, other than cave counts, monitoring of bat population trends is not feasible due to technical limitations in sampling free-ranging bats. For these reasons, bats are deemed inappropriate as MIS. They will, however, continue to be addressed when environmental effects are documented at both the forest plan and site-specific project levels. Cave counts and forest-wide inventory efforts will also continue.

**Bald Eagle (*Haliaeetus leucocephalus*):** One nesting pair as well as transient individuals occurs on the Forest. The species is ineffective as an MIS because one pair is too small of a population sample. The wide ranging movements and the transient nature of other individuals using the national forest also offers insufficient information. Because bald eagles spend much of their time off the national forest, it would be difficult to associate population trends with national forest management activities. Monitoring of bald eagles as a T&E species, however, will continue.

**Red-cockaded Woodpecker (*Picoides borealis*):** The RCW would perhaps be our most appropriate T&E species to be selected as an MIS. It is highly responsive to habitat changes induced through active forest management, and it is easily and effectively monitored using long-established and consistent protocols. However, it was not chosen as an MIS because the DBNF (and presumably Kentucky) population was extirpated following a severe southern pine beetle epidemic in 1999-2002 that killed most yellow pine stands on the Forest.

**White-haired goldenrod (*Solidago albopilosa*):** White-haired goldenrod, which does not appear to have biological or habitat barriers to survival, is a species for which protection of populations is important. Management of these populations per se may not be needed, however, and a direct tie between management and species response is unclear. The species is currently monitored and will be monitored in the future.

**T&E and Other Rare Salamanders:** As discussed previously, these species are generally not effective MIS due to their high population variability, the influence of moisture on their detectability, and the difficulty in relating population changes to management effects. Efforts to monitor T&E and other rare salamanders will continue or be expanded as effective techniques are validated. However, designating them as MIS is inappropriate at present.

**T&E and Other Rare Fish:** Stream and riverine fish are deemed inappropriate as MIS because sampling variability is high, making determination of trends difficult (see USDA Forest Service 2001b). In addition, their sensitivity to habitat changes arising from off-forest influences, as well as their ability to move between private and national forest lands in many cases, makes it difficult to attribute population changes to national forest management. However, monitoring of T&E and other rare fish species will continue as part of a comprehensive stream-monitoring program.

**Mussels:** Mussels are also deemed inappropriate as MIS because of the difficulty inherent in monitoring trends and attributing population changes to management activities on national forests. Mussels are greatly dependent on high-quality water, which is influenced by the cumulative effects of activities originating on private as well as national forest lands. However, as with other T&E species, inventory and monitoring of mussels will continue.

**Rare Plants:** Many T&E plants require protection only of known locations. Because their populations do not primarily reflect effects of management activities, they are often ineffective as MIS. However, T&E plant species that are known to be highly associated with, or responsive to, forest management activities are appropriate. Fire-dependent species meet these criteria. One T&E species on the forest that probably is dependent on prescribed fire is American Chaffseed (*Schwalbea americana*). This species is currently considered historic on the Forest, but there are no populations with which to monitor the effects of management on its recovery. Therefore, it has not been selected as an MIS. Other T&E plant species will continue to be monitored.

## SPECIES WITH SPECIAL HABITAT NEEDS

Species under this group are closely dependent on special habitat elements that may be affected by national forest management. They are considered for selection because they may help document the effects of management on these special habitat elements.

**Snag dependents:** The pileated woodpecker (*Dryocopus pileatus*) was considered for selection as an MIS because it requires large snags for nesting and feeding. The occurrence of this species may be correlated with forested habitats containing abundant large dead trees and fallen logs (Hamel 1992). Such habitat may also be used by other woodpeckers, owls, numerous other birds, mammals, and amphibians. Use of the pileated woodpecker could help indicate the effects of management activities on the availability of forests with a desired abundance of snags. However, according to local observations and bird survey data, this species is highly sensitive to human presence. It may leave an area, such as a monitoring station, before an observer can account for it. Its use as an indicator is also limited by its wide-ranging habits, which cause it to be documented in forest types that are not particularly suitable. It also occurs at relatively low densities, reducing the number of data points available for trend estimates. For a variety of reasons, plan provisions call for snag retention as well as creation. As vegetation surveys associated with bird surveys, and project planning collect snag data, analysis of this variable will provide some picture of management effects on the pileated woodpecker and other snag-dependent wildlife.

**Hard mast dependents:** Although the gray squirrel (*Sciurus carolinensis*) is the species most closely associated with hard mast capability, it is an ineffective indicator of the quality or abundance of these habitats. Even in good habitats, its populations can fluctuate greatly as weather conditions create wide variations in mast production from year to year (see USDA Forest Service 2001b). Other species such as bear, deer, and turkey benefit from hard mast production, but their population trends also reflect a variety of other factors, including hunting harvest. Acres of mature oak forest is a more useful and direct indicator of trends in hard mast production capability and, therefore, will be used to indicate effects to mast-dependent species instead of an MIS.

**Mature forest interior dependents:** Concern over forest interior habitats is primarily focused on effects to migratory birds. Several bird species are associated with forest interior. The ovenbird (*Seiurus aurocapillus*) is deemed the most appropriate of these as an MIS. It is strongly associated with mature forest interior habitats (Hamel 1992, Crawford et al. 1981) and is also common enough to be feasibly monitored for trends. Long-term monitoring of this species has resulted in some of the most robust data sets of any of the interior bird species surveyed on the Forest. This species is selected to help indicate the effects of management on the availability of suitable mature forest interior habitats. Other elements, such as landscape analysis of forest fragmentation using remote sensing data, would supplement information received from monitoring this species. In addition we have selected the black-throated green warbler specifically as a resident of mature cove forest. Our monitoring data indicate it is a good choice with much the same qualities as ovenbird.

**High-elevation early-successional dependents:** The Forest currently has no high-elevation habitat, although Forest Plan objectives encourage the acquisition of such. We have a few recent records of golden-wing warbler on the Forest, but at lower elevations (1200-1300 feet amsl). The golden-winged warbler (*Vermivora chrysoptera*) would be the most appropriate MIS for high-elevation early-successional habitats because of its strong association with these habitats and because its populations should be responsive to forest management efforts to create and sustain such habitats. But it was not chosen as an MIS because the DBNF contains little of its usual habitat, and there is

only scattered evidence of the species on the Forest. The DBNF will monitor the species, however, as part of the Forest Service's Region 8 Landbird monitoring program.

**Mature riparian forest:** The Acadian flycatcher (*Empidonax virescens*) is deemed the most appropriate species to indicate management-induced changes to mature riparian forests. It is highly associated with mature deciduous forests along streams and bottomland hardwoods, which it uses for feeding and reproduction (Hamel 1992). It can be effectively monitored using proven, consistent protocols. It is relatively common in these habitats, providing enough data for evaluation. This species is selected to help indicate the effects of management activities on mature riparian habitats. Salamander species, although often associated with this habitat, are not particularly effective MIS for the reasons described previously.

**Cliff-top Pitch Pine:** Pitch pine (*Pinus rigida*) was severely impacted by the recent southern pine beetle epidemic. It was in low numbers prior to this epidemic and during it, most mature or mid-age individuals died and much of the limited natural regeneration that had occurred also died. Pitch pine regeneration, both natural and artificial, will be monitored to assess gains in restoration of the species and the habitat it helped produce along cliff tops.

## SPECIES THAT ARE HUNTED, TRAPPED, AND FISHED

Species considered under this category include deer, turkey, quail, fish, and other harvestable species that are in high public demand for consumptive uses. Demand MIS are used to help assess effects of management on meeting this expectation of national forests. Drawing inferences about the effect of national forest management on these species is difficult, in large part, because the state fish and wildlife harvest regulations control their populations. Nevertheless, species in this group may be appropriate as MIS if the role of harvest regulation and demand can be evaluated along with habitat trends. This situation will normally occur where state fish and wildlife agencies collaborate in monitoring efforts.

**Furbearers:** Common species of furbearers found on national forests are fox, bobcat, raccoon, mink, otter, and beaver. As a group, these species were judged inappropriate for selection as MIS for several reasons. Consumptive demand for furbearers on the DBNF is small. These species are typically habitat generalists, making evaluation of relationships to habitat changes difficult. In addition, they generally are wary, often occur at low densities, and, therefore, are not feasible to monitor with precision.

**Eastern wild turkey (*Meleagris gallopavo*):** This species is distributed across the Forest and in good numbers. However, as a generalist that uses a wide variety of habitats, the species may or may not be affected by Forest Service management. The species is most commonly encountered when it ventures into grassy openings, and monitoring of such occurrences may not reflect populations. Wild turkey is also affected by mast production, which is erratic and weather related (see USDA Forest Service 2001b). Eastern wild turkey will be monitored through state harvest records and the Forest's participation in the Region 8 Landbird monitoring program.

**Ruffed grouse (*Bonasa umbellus*):** This species is distributed across the Forest in moderate numbers, and can be expected to respond to Forest Service management practices. Specific, intense management for this species occurs in some areas of the Forest skewing populations, however, and the state periodically captures animals from the Forest for re-introduction elsewhere, again skewing

populations. While this species is not selected as an MIS, it will be monitored through state harvest records and the Forest's participation in the Region 8 Landbird monitoring program.

**Eastern gray squirrel (*Sciurus carolinensis*):** This species is distributed across the Forest in moderate numbers. It was not chosen as an MIS for the reasons stated above under mast-dependent species.

**Black bear (*Ursus americanus*):** This species is slowly spreading into Kentucky. Its numbers are low and consist primarily of displaced young males. It is a generalist and uses a wide variety of habitats that may or may not be affected by Forest management. In addition, the Black bear was not considered as a management indicator species because recent research (Mitchell and Powell 2003) indicates their response to managements actions differ according to maturity and sex. The level of monitoring required to differentiate among age/sex/management action relationships is beyond our means.

**North American elk (*Cervus canadensis*):** This species was recently re-introduced into Kentucky to establish a population not seen in the state for more than 200 years. Because of this recent arrival (via re-introduction) in Kentucky and its limited distribution on the DBNF, this species was not chosen as an MIS. The Kentucky Department of Fish and Wildlife Resources continues to fund research and monitoring projects to learn more about the lifestyle of elk in Kentucky.

**Northern bobwhite [quail] (*Colinus virginianus*):** This species is present on the Forest in low, but increasing, numbers. It is expected to respond to Forest management action in appropriate habitat types. It is associated with a desired mix of grassland, wooded grassland/shrubland, woodland, and open forest maintained by fire in which grasses and forbs dominate the vegetation on the forest floor. This species has been chosen as an MIS.

**White-tailed deer (*Odocoileus virginianus*):** This species is widespread on the Forest in moderate to high numbers. Review of available data (USDA Forest Service 2001b) indicated that it is a poor ecological indicator, in part because of its generalist nature. Forest management may or may not affect population numbers. It was chosen as an MIS specifically because of interest shown by the state and other groups in this species' high profile game status. Various habitat conditions on the Forest will be monitored which may be related to population trend data collected by the state.

## NON-GAME SPECIES OF SPECIAL INTEREST

Species considered under this category are those for which there exists special public interest for non-consumptive reasons. They may be selected for the purpose of focusing assessment on such species when management is expected to have a major influence on their populations. Public interest in non-game species is typically generalized, rather than focused on one or a few species (e.g., interest in wildflowers, birds, and other wildlife for viewing or nature study). Most species of special interest are represented by other species already chosen in other categories. Interest in any one species is not sufficient to drive MIS selection beyond those species already selected under other categories. Those species cover the special interests that are to be considered under this category.

## SPECIES THAT INDICATE EFFECTS TO MAJOR BIOLOGICAL COMMUNITIES

Species considered under this category are those whose populations respond to management-induced changes in key ecological conditions within a community. These ecological conditions should be important to other members of the community as well. Selection of MIS under this category should help focus attention on maintenance and restoration of desired conditions within major biological communities.

**Rare Communities:** By definition, rare communities are small and discrete habitats that are uncommon on the landscape. Because of their rarity and importance to providing for a diversity of plant and animal communities, occurrences will be monitored directly. Monitoring will focus on the maintenance of desired conditions including presence of associated species. Because monitoring will be done directly, no MIS are selected for these communities.

**Mid- and Late-Successional Mesic Deciduous Forest:** The cerulean warbler (*Dendroica cerulea*) is selected as the MIS for mid- to late-successional mesic deciduous forests. Breeding territories are especially associated with canopy gaps within these forests. Although it is relatively common on the DBNF, as least in some areas, monitoring will focus on determining presence and population response to creation of canopy gaps through management activity. This species is selected to help indicate effects of canopy gap creation on species associated with mid- to late-successional mesic deciduous forests. In addition, the black-throated green warbler (*Dendroica virens*) was selected as an MIS in this forest type for the reasons stated above in mature forest dependents.

**Mid- and Late-Successional Hemlock-White Pine Forests:** Native communities of this type are primarily located along streams and stream terraces. Management direction is to protect these forests, but little active management is planned. Therefore, no MIS is selected for this community.

**Mid- and Late-Successional Oak and Oak-Pine Forests:** Because of their wide distribution across moisture gradients, mid- and late-successional oak and oak-pine forests support a wide variety of species. Cerulean warbler, selected as an MIS for mid- and late-successional mesic deciduous forests adequately, represent, in part, mesic oak forest communities. This species is expected to respond positively to management actions (including thinning and moderate frequency burning) designed to stimulate advanced oak regeneration and perpetuation of the forest type on these mesic sites. Drier oak forests support a slightly different mix of species due to their more open condition. [To represent this upland oak and oak-pine community, the summer tanager, in part, is selected as an MIS. This species is most abundant in a mix of open upland mature deciduous forest and open upland oak-pine forest (Hamel 1992).] Ovenbird, mentioned earlier is also tied in part to this habitat. Trends for these species will be evaluated along with trends in total acres, age-class distribution, and levels of restoration and maintenance activities in this forest type to provide a more complete picture of effects of management on this community.

**Mid- and Late-Successional Pine and Pine-Oak Forests:** Pine forests have been in serious recent decline on the DBNF as a result of southern pine beetle epidemics and the lack of fire needed to maintain their dominance. Therefore, they will be the focus of ecological restoration and maintenance on some portions of the Forest. The pine warbler (*Dendroica pinus*) is closely associated with pine and pine-oak forests, generally occurring only where some pine component is present. Therefore, it is an appropriate indicator of the effects of management in restoring and maintaining pine forests. This species does not discriminate as to the condition of pine stands relative to mid and understory, however, and would indicate little more than the presence of pine.

Other bird species that may be associated with desired fire-maintained conditions were deemed unlikely to be present in sufficient numbers to serve as MIS. Understory plant species also were considered and found to be too universal in association to be appropriate MIS. Therefore, pine warbler and various habitat-based elements, such as amount and effectiveness of prescribed burning, will be used to indicate effects of management on species associated with this community.

**Woodlands, Wooded grasslands/shrublands, and Grasslands:** Historic woodland, wooded grasslands/shrublands, and grassland communities on the DBNF will be the focus of restoration efforts to reduce tree cover and restore periodic fire (see Campbell et al. 1991, Delcourt et al. 1998, Delcourt, 2002, Ison 2000, Owen 2002 for discussions related specifically to the Forest area and Cumberland Plateau/Appalachian Provinces). Over time, these activities are expected to create grass-dominated understories. Indian grass (*Sorghastrum nutans*) and other species of native warm-season grasses were considered as MIS because they can be indicators of open habitats and conditions associated with frequent fire. However, these species occur along roadways, in utility rights-of-way, and old fields where only mowing maintains them. A community approach to monitoring in fire-maintained areas will be used instead. The field sparrow (*Spizella pusilla*) is selected because of its association with scattered saplings or shrubs in tall weedy or herbaceous cover (Hamel 1992). In addition, chipping sparrow (*Spizella passerina*), Northern cardinal (*Cardinalis cardinalis*), summer tanager (in part), and Northern bobwhite (in part) are selected as MIS for this group of habitats. Chipping sparrow is associated with the more open pine and pine-oak portion of this habitat group (Hamel 1992). Northern cardinals are associated with the open shrubby/brushy portion of this habitat group (Hamel 1992). Although Northern cardinals may occur in any forest type and condition on the DBNF, bird survey data on the Forest indicate they are most common in the open, brushy areas. Summer tanager is discussed above in the upland oak and oak-pine section. Since this species tends to inhabit the more open stands, it also is associated with the oak and oak-pine (also pine-oak and pine to some extent) woodland portion of this habitat group. Northern bobwhite is discussed above in the demand section. They are associated with all of the conditions in this habitat group but usually in the most open canopy areas. All of these species may be effectively monitored using established protocols. These species will help indicate community response to efforts to maintain and restore this community. Monitoring will focus on presence of these species within restoration areas.

**Early-Successional Forest:** The yellow-breasted chat (*Icteria virens*) was selected as the most appropriate MIS to represent general early-successional forests. This species is closely associated with this habitat condition on the Daniel Boone National Forest based on bird survey data from the Forest. Eastern towhee (*Pipilo erythrophthalmus*) was also selected as an MIS because of its tendency to occur in this habitat type (Hamel 1992), and to maintain continuity from the previous plan into this one. The prairie warbler (*Dendroica discolor*) is selected as the most appropriate MIS to represent early-successional pine forests. Prairie warblers are shrubland nesting birds that require dense forest regeneration or open shrubby conditions in a forested setting. Near optimal habitat conditions are characterized by regeneration, thinned area or patchy openings 10 acres or more in size where woody plants average 2 to 3 meters in height, 3 to 4 cm dbh, and occur in stem densities around 3000 stems/acre (Natureserve 2001). Prairie warbler populations respond favorably to conditions created 3 to 10 years following forest regeneration in larger forest patches (Lancia 2000). Providing a sustained flow of regenerating forests is necessary to support populations of this species. On the DBNF, monitoring data indicate that this species is most closely tied to yellow pine regeneration.

**Old-growth:** Because most species associated with old-growth conditions are found in late-successional forests, separate indicator species were not selected for old-growth successional stages. Late-successional indicator species as identified in this document would be monitored in both late-successional and old-growth habitats. Abundance of old-growth habitats would be monitored separately to allow evaluation of trends in availability of this habitat condition.

**Aquatic Communities:** A community-based monitoring approach will be used to assess aquatic habitats, in lieu of designating individual MIS. These approaches look at community composition as an indication of the integrity of aquatic communities. A focus on community composition reduces the variability inherent in looking at an individual species, and thus provides more accurate information on the status of the community and the health of aquatic systems. Therefore, no individual MIS are selected to represent aquatic communities.

In summary, 15 species have been selected as management indicator species for the revised forest plan (Table 2). They will be used to assess effects of alternatives and to help monitor effects of implementing the selected alternative.

**Table 2. Management Indicator Species selected for use in the DBNF's 2004 Forest Plan and primary reason(s) for their selection.**

Common Name	Scientific Name	Primary reason(s) for selection
Acadian flycatcher	<i>Empidonax virescens</i>	Special habitat needs; special interest
Black-throated green warbler	<i>Dendroica virens</i>	Ecological indicator (major biological community); special interest
Cerulean warbler	<i>Dendroica cerulea</i>	Special habitat needs; ecological indicator (major biological community); special interest
Summer tanager	<i>Piranga rubra</i>	Ecological indicator (major biological community); special interest
Chipping sparrow	<i>Spizella passerina</i>	Ecological indicator (major biological community); special interest
Northern cardinal	<i>Cardinalis cardinalis</i>	Ecological indicator (major biological community); special interest
Field sparrow	<i>Spizella pusilla</i>	Ecological indicator (major biological community); special interest
Eastern towhee	<i>Pipilo erythrophthalmus</i>	Ecological indicator (major biological community); special interest
Yellow-breasted chat	<i>Icteria virens</i>	Ecological indicator (major biological community); special interest
Ovenbird	<i>Seiurus aurocapillus</i>	Special habitat needs, ecological indicator (major biological community); special interest
Pine warbler	<i>Dendroica pinus</i>	Ecological indicator (major biological community); special interest
Prairie warbler	<i>Dendroica discolor</i>	Ecological indicator (major biological community); special interest
Northern bobwhite [quail]	<i>Colinus virginianus</i>	Ecological indicator (major biological community); demand species; special habitat needs
Pitch pine	<i>Pinus rigida</i>	Special habitat needs; special interest
White-tailed deer	<i>Odocoileus virginianus</i>	Demand species



It may appear that selected MIS are not adequate to represent all species or potential management effects as needed to provide for species viability and forest health as well as diversity. However, of the five categories of MIS listed in the regulations, only one category is to be selected because they are believed “to indicate effects of management activities on other species of selected biological communities” (36 CFR 219.19(1)). The purpose of other categories of MIS are to focus attention on effects of management on T&E recovery, species with special habitat needs “that may be influenced significantly” by management, and to meet public demand for game and non-game species. This appendix clearly documents our consideration of species under each of these categories (see below).

Based on these five categories, it is clear that not all MIS are to serve as “proxies” for other species; some are of direct interest themselves. Regulations make no direct link between species viability requirements and MIS. Use of MIS as the sole or primary means of assessing viability risk is not consistent with the best science, as addressed above. DBNF planners have made no effort to select MIS to represent *all* species or all management effects, but there is no requirement to do so. As indicated above, species viability requirements have been addressed primarily through direct evaluation of all species of viability concern and a mix of monitoring strategies.

Finding species that meet these criteria is more difficult than it might first appear, especially in light of current scientific understanding. When regulations were adopted in the early 1980s, use of MIS was deemed the best approach for addressing biological diversity. Today, their use as the sole or primary means of planning and evaluating biological diversity is regarded as rather simplistic. The vast amount of research and scientific publication over the past 20 years has provided greater insight into ecological interactions and ecosystem functions. There is now a much greater appreciation for the complexity of population responses as well as the limitations of using one species as a “proxy” for whole communities. The inherent difficulties in precisely monitoring populations of many species is also more recognized.

As a result, there has been less emphasis on MIS during this round of planning, while remaining in compliance with both the letter and intent of regulations. At the same time, there has been greatly *increased* emphasis on consideration of viability of many more individual species, and incorporated use of ecologically-based vegetation classification systems, newly developed by The Nature Conservancy and NatureServe. Use of this classification system includes recognizing and protecting rare community types. In addition, rather than focusing on a handful of individual species, our monitoring programs have increased emphasis on observing species groups and communities, such as birds, bats, fish, and rare communities. This approach should provide much better information on more species as well as overall system function. Where appropriate, individual species will be monitored. Work will continue with partners in Forest Service Research and at universities to encourage and support research on key biological issues that are too complex to be addressed DBNF monitoring programs.

This shift in emphasis reflects an understanding of the latest science as well as an increased commitment to biological conservation by the Forest Service and not, as some may suggest, an attempt to avoid these issues.

The same set of MIS is used to evaluate all Alternatives, including the No Action alternative. This alternative is also evaluated with existing MIS (USDA Forest Service 2001b). While each alternative represents a different set of management regimes and objectives, MIS are independent of this. Regulations governing MIS state: “Planning alternatives shall be stated and evaluated in terms of both amount and quality of habitat and of animal population trends of the management indicator

species” (36 CFR 219.19(2)). MIS are not actions or outputs, the variables that typically vary by alternative. They are planning tools, used to “indicate” management effects by alternative. Changing MIS with each alternative would greatly reduce their usefulness as constants to compare and contrast effects across alternatives. Such a strategy would be inconsistent with the Forest Service’s reading of regulatory intent. The likely effects upon quantity and quality of habitat as well as MIS population trends are analyzed and disclosed under the appropriate sections of the EIS, in compliance with both NEPA and NFMA.

Species from other taxonomic groups were also considered as MIS. Generalists species from other taxonomic groups should be provided for through coarse filter monitoring using other species. A variety of habitats on the ground should provide an array of usable habitat for these species. Habitat specialists, such as salamanders and many plants, occupying general classes of conditions, e.g., old mixed mesophytic forest or upland oak forest, should again be provided for using the coarse filter approach. By choosing MIS with relatively large home ranges compared to those of other species using the same general habitat, or specific, undocumented or poorly understood microconditions within the general habitat, the likelihood of including these microconditions is increased. Specific, but uncategorized, conditions in many cases have been addressed through management prescription areas. Species ineffectively monitored should be addressed through a combination of coarse and fine filters.

Mammals tend to be either wide-ranging generalists, e.g. white-tailed deer and black bear, or secretive animals that may not be effectively monitored, e.g. spotted skunk. Wide-ranging generalists often may not be effectively monitored because specific agency actions are not easily tied to population trends, and groups of animals or individuals often do not stay in any one area. In addition, the black bear was not considered as a management indicator species because recent research (Mitchell and Powell 2003) indicates their response to managements actions differ according to maturity and sex. The level of monitoring required to differentiate between age, sex, and management actions is beyond the means of the Forest Service. North American elk was not considered as a management indicator species because of its recent arrival (via re-introduction) in Kentucky and its limited distribution on the DBNF. The Kentucky Department of Fish and Wildlife Resources continues to fund research and monitoring projects to learn more about the lifestyle of elk in Kentucky. However, white-tailed deer was chosen a game species MIS. Plants generally fall into three groups, wide ranging generalists for which management actions are not demonstrably tied to populations; uncommon, but widely distributed habitat specialists for which specific management actions are unknown; and species for which effective monitoring methods are not demonstrated.

Most amphibians and reptiles do not meet the criteria of appropriate MIS because they often require a sampling effort beyond the Forest Service’s current capability. Although some researchers make a case for salamanders as indicators of ecosystem integrity (Welsh and Droege 2001), salamander population trends in the Southern Appalachians high sampling variability can make monitoring particularly difficult (Hyde and Simons 2001). Our inability to count them with precision makes inferences on relationships between population trends and habitat changes unreliable and difficult. The Forest Service is working closely with cooperators to improve, develop, and standardize survey protocols for both amphibians and reptiles so that effective monitoring programs can be established and expanded. Currently, inherent limitations to monitoring this group make them generally ineffective as MIS.

Salamanders, often used as indicators of intact older forest, are difficult to monitor effectively. Often cited literature, in particular Welsh and Droege (2001), support the usefulness of salamanders as

MIS. The Forest Service has reviewed this literature and recognizes the validity of the general points presented. However, other evidence from the scientific literature highlights inherent difficulties in monitoring trends of salamander populations. Based on a study of salamander monitoring methods conducted in the Great Smoky Mountains National Park, Hyde and Simons (2001) concluded “[t]he extreme variation inherent in all the methods we examined ( $CV > 100\%$ ) severely limits their utility for population monitoring” and “[t]he feasibility of monitoring terrestrial salamander populations over large geographic areas using current methodologies remains suspect.” They also state “the development of reliable sampling methods... is essential before extensive monitoring programs are established.” In addition, the complex variations between species would preclude selecting salamanders as a group, as some commenters suggest. According to Hyde and Simons, “[b]ecause spatial and temporal patterns of distribution and abundance are species-specific, salamander population data should be considered on a species-by-species basis.” Until some of the uncertainties related to monitoring methods are worked out, Forest Service planners regard salamanders as ineffective MIS.

Simply because salamanders or reptiles have not been selected as MIS does not mean they will be ignored. Several salamanders and reptiles have been analyzed as species of viability concern. Status of their habitats and/or populations will be monitored during plan implementation (see Monitoring Summary Table, Forest Plan Appendix D, monitoring questions 1, 2, 4, 7). In addition, general effects of management activities on salamander populations have been well documented in the scientific literature. Management actions (such as overstory removal and prescribed burning) that result in drying of litter and upper soil layers are detrimental to most salamanders and their habitats. The 2004 Forest Plan includes strategies for maintaining moist-soil habitats, such as emphasizing mature forests in riparian corridors and protecting seeps, springs, bogs, fens, seasonal ponds, and prime coves as rare communities. A relatively small proportion of mesic sites is expected to be negatively impacted from management activity, while the majority of these sites are expected to continue to age and improve in quality (with some serious exceptions due to the expected near-future invasion of the hemlock wooly adelgid, an invasive non-native insect). For reptiles, the Forest Plan includes strategies for maintaining grassland, open forest, woodland, and wooded grassland as well as appropriate riparian habitat. See the Biological Elements and Resource Program sections of the FEIS for more details.

The 1985 Forest Plan listed seven fish species as aquatic MIS, but they were determined not to have fulfilled their intended purpose. It was also recommended that the MIS fish be replaced with aquatic macroinvertebrates as measured through indices (USDA Forest Service, 2001b).

Regulations found at 36 CFR 219.19 stipulate that MIS populations should reflect management activity and when these species can be effectively monitored. The DBNF’s patchwork ownership pattern includes numerous areas of private or other agency ownership within the various 5<sup>th</sup> level HUCs (watersheds) that cover the Forest. In over 30 of the 49 watersheds found on the Forest, National Forest System land account for less than one-half of the land. This fragmented ownership, combined with the relatively mobile nature of fish and the influence of non-National Forest System lands on the watersheds, make the effects Forest Service management on fish very difficult, if not impossible, to discern. On smaller watersheds where the DBNF manages the headwaters, the effects of management actions on aquatic organisms can be determined if the organisms have local home ranges.

Aquatic macroinvertebrates (largely insects), known to be sensitive to water quality and sedimentation, are limited in their movement. This makes them ideal ecological indicators for the

aquatic system. However, individual species are not as effective at reflecting aquatic health as are indices based on aquatic macroinvertebrates communities. In addition to monitoring physical and chemical parameters of the aquatic system, the DBNF will track indices based on aquatic macroinvertebrate assemblages that reflect the community structure and function,. Because these biological indices are not individual, or even groups of, species, they do not strictly fit the CFR 36 219.19 definition of ‘management indicator species.’ However, they fulfill all the criteria for MIS and are more effective than any individual or small group in reflecting the health of an aquatic system. Such indices reflect changes in populations of various species, populations that are easily influenced by management activities (see below). This meets the fundamental clause “because their population changes are believed to indicate the effects of management activities” (36 CFR 219.19 (a)(1)). Aquatic macroinvertebrates as a group are widely distributed throughout the DBNF. They can be found in nearly every stream and body of water on the Forest. Indices based on macroinvertebrate assemblages provide a numerical representation of the community structure and function, accurately reflecting the health of the aquatic habitat being evaluated. Such indices can be reliably compared from one stream to the next. They can be used to not only indicate clean or adversely impacted streams but can reflect the degree of impact. When combined with physical and chemical data, the source and/or cause of adverse impact can often be determined. This will also greatly facilitate the monitoring of many of the threatened and endangered aquatic species on the DBNF.

Fish communities will be sampled at the time of macroinvertebrate sampling. Evaluation will consist of a biotic integrity index.

## **SEDIMENT YIELD AND CUMULATIVE EFFECTS MODEL**

A sediment yield/cumulative effects model was developed (Clingenpeel 2002) to estimate sediment yields and analyze the cumulative effects of proposed management actions on water quality. More technical assumptions associated with the model can be found in the process paper (Clingenpeel 2002) with a citation found in the list of references. The process provided a means to systematically evaluate water quality conditions for 5th level watersheds covered in whole or in part by the Forest Plan. The process also provided results that aided in aquatic viability analysis at the community scale.

The model first determined the current condition of each 5th level watershed (all lands). This was accomplished by ranking on a relative scale (1 –5) the condition of each watershed in terms of sediment, point source pollution, stream temperature and altered stream flow. Sedimentation was assessed based on current land uses represented in each watershed. Estimates of current sediment were expressed as a percent increase above a baseline condition (forested, with no roads). Point source pollutants were expressed as a density (points per square mile). Temperature was assessed based on the road density in the riparian area and the percent of the riparian area forested in the 1970’s and 1990’s. Altered stream flow was evaluated based on the number of dams, road density in the riparian area and average density of strip mines (1970’s and 1990’s) within each 5th level watershed.

Major assumptions associated with the model included:

- Sediment yield is an appropriate surrogate for determining cumulative impacts to water quality.
- Fifth level watersheds are the appropriate scale of analysis for cumulative effects to water resource.
- Appropriate erosion coefficients from Dissmeyer and Stump (1978) approximate erosion rates from land use activities on CNF lands.

The model provided the following information:

- Estimates of the current sediment yield within 5th level watersheds covered in total or partially by the Forest Plan.
- Estimates of sediment yield attributable to Forest Service activities by alternative and planning period.
- Estimates of cumulative sediment yields for entire 5th level watersheds (all ownerships) by alternative and planning period.
- An index of watershed health for 5th level watersheds based on the percent increase in sediment yield above a baseline condition. The initial watershed index is determined by using the relative abundance of locally adapted species with respect to sediment increases. The score is modified based on physiographic province, percent of national forest ownership within the watershed, percent of the riparian that is forested, and road density within riparian.

## **INCORPORATING THE SCENERY MANAGEMENT SYSTEM**

The Visual Management System, introduced in 1974 as a planning and management tool for National Forests, established an inventory procedure to track and maintain visual quality. In June 1995, Landscape Architects and Planners from Region 8 and Region 9 were introduced to a new handbook which revised the Visual Management System and renamed it the Scenery Management System.

The Scenery Management System (SMS) replaces Volume II, Chapter I, of the Visual Management System (VMS) also known as “The Big Eye Book.” The rest of the VMS Volume II chapters remain current. While the system remains essentially intact, still supported by current research, terminology has changed, and the system has been expanded to incorporate updated research findings. The SMS differs from the VMS in that it increases the role of constituents throughout the inventory and planning phases, and it borrows from and is integrated with the basic concepts and terminology of Ecosystem Management. The SMS provides for improved integration of aesthetics with biological, physical, and social/cultural resources in the planning process.

There are similarities in the two systems. The following compares the terminology of the systems:

**Table B - 16. Comparison of the Terminology between the Visual/Scenery systems.**

<b>Scenery Management System (SMS)</b>	<b>Visual Management System (VMS)</b>
Landscape Character	Characteristic Landscape
Concern Levels	Sensitivity Levels
Distance Zones	Distance Zones
Scenic Attractiveness	Variety Class
Constituent Information	New
Scenic Classes (1-7)	New
Scenic Integrity Objective	Visual Quality Objective
VH (Very High Scenic Integrity)	Preservation
H (High Scenic Integrity)	Retention
M (Moderate Scenic Integrity)	Partial Retention
L (Low Scenic Integrity)	Modification
VL (Very Low Scenic Integrity)	Maximum Modification
Scenic Integrity Level 9 same as above, except includes UL (Unacceptable Low)	New
Existing Scenic Integrity	Existing Visual Condition

In late 1995, the Daniel Boone National Forest Landscape Architect began to update existing Visual Management System maps and convert them to Scenery Management System Maps. Inventory components were completed using a variety of field and in-office methods to reverify and/or update old inventories. As much of the original VMS inventory data as possible was utilized. District and public input was obtained and new information was field checked before mapping. In *The Boone Planner* of April 1997, the public was asked to provide input on “special” places in the National Forest. Comments received were checked on the ground and mapped as appropriate. The Initial Inventory was completed later in 1997. This initial mapped inventory was entered in a computer database in 2001.

The Daniel Boone followed the lead of the five southern Appalachian national forests in determining the Scenic Integrity Levels (SILs) and Landscape Character Themes (LCTs) for each prescription area. Using the Land Class, SIL’s and LCT’s matrix, acres of Scenic Integrity Objectives (SIOs) were assigned prescription areas. Chapter two and three display the Scenic Integrity Objectives (SIOs) and Landscape Character Goals (LCGs) by alternatives. The assigned goals and objectives are based upon the 1997 inventory. When an activity is planned for a specific site, the area around the activity will be re-evaluated and a final SIO and LCG will be assigned and placed on the inventory map.

## **ECONOMIC AND LOCAL GOVERNMENT IMPACT ANALYSES**

The purpose of this portion of Appendix B is to provide interested readers with additional details regarding the social and economic analyses. This section does not provide sufficient information to replicate the analysis. For that level of detail, the companion specialist reports contained in the administrative record should be consulted.

Economics was not a significant issue in the Plan revision. However, when they were relevant, economic data became a factor in decision-making. Economic data were used as required to make informed decisions. Data used throughout the FEIS were deemed reliable or adjusted based upon updates to become the most reliable at the time.

36 CFR 219.12(g)(1) requires an analysis of expected outputs during the planning period. It suggests use of outputs, which include marketable goods and services as well as non-market items, such as recreation, and wilderness use, wildlife and fish, protection and enhancement of soil, water, and air, and preservation of aesthetic and cultural resource values. Based on these resources, the FEIS undertook to show a present net value as required by 36 CFR 219.

The Forest has discussed in a narrative fashion only the foreseen environmental consequences of the proposed land management alternatives. For resources that can be reasonably valued via market data (e.g. timber, minerals), and for those non-market resources that have estimated values based on Forest Service research, we have presented values using a present net value calculation. For resources that have no values estimated by generally accepted methods, we have chosen to discuss in a narrative fashion in the course of assessing net public benefits.

U.S. Forest Service activities on the DBNF are governed by a large number of rules and regulations designed to mitigate negative impacts or otherwise protect resources. In the planning process, such benefits associated with regulations are seldom quantified in dollar terms. The costs for achieving these benefits come in the form of increased operating costs and reduced timber revenues.

Therefore, an attempt was made in the planning process to fully enumerate the dollar values of all market and non-market benefits as well as the costs that can reasonably be expected to occur due to an alternative in an attempt to provide as much relevant information as possible to aid in making an informed decision.

Option values and existence values are not items suggested to be discussed under 36 CFR 219. These are highly controversial methodologies, which can be of a contentious nature with many publics. The Forest Service has chosen not to use values based on questionable and controversial methodologies and values not specifically required by Forest Service directives.

Many of the “ecosystem services” provided by forested land, such as flood control, purification of water, recycling of nutrients and wastes, production of soils, carbon sequestering, pollination, and natural control of pests; and externalized costs of resource extraction, such as increased rates of death, injury and property damage resulting from accidents involving heavy equipment, log trucks, ORVs and other dangers related to intensive resource use and development, are considered to be effects remote from resource management on the Daniel Boone NF. Their speculative and unforeseen nature does not warrant a consideration in the efficiency analysis required by 36 CFR 219.

The Forest Service does not use its socio-economic analysis quantified measures and indexes as the sole means of displaying alternative inputs (FSM 1970.8(5)). Such a value is one piece of

information for the decision maker to use in making selections among alternatives. Other resources that are impacted are discussed qualitatively. Their consequences in forest management are decided along with the monetized resource in arriving at an alternative that maximizes net public benefits. After reviewing the planning documentation and comments from the public participation, the determination of the best alternative, which maximizes public net benefits, is left to the judgment of the decision maker.

## **THE MODELS**

Economic effects to local counties were estimated using an economic input-output model developed with IMPLAN Professional 2.0 (IMPLAN). IMPLAN (Impact Analysis for Planning) is a software package for personal computers that uses the latest national input-output tables from the Bureau of Economic Analysis. The software was originally developed by the Forest Service and is now maintained by the Minnesota IMPLAN Group, Inc (MIG). Data used for the impact analysis was from secondary data for those counties considered to be in the forests impact areas. The assumption used in this modeling process was that the impact area comprised the counties within the forests' designated county boundaries. The data source used in developing the models for impact purposes was the most recent county data available from MIG (1998). County data is used in the model to develop one impact response coefficient for each resource or activity in the analysis area.

Input-output analysis gives estimates of employment and income for an increase in final demand on certain sectors of the economy. For Forest Service timber, for example, we have looked at the saw mill and pulpwood industries where our timber goes as the first processing step in manufacturing. Impacts include all those industries initially impacted as well as those industries linked with supplying inputs to production, as well as workers in those industries who spend wages in their households (known as direct, indirect and induced effects, respectively). Thus, the impact assumes a new demand is made on the economy and estimates what this new increase in final demand will mean in employment and income to that economy. Input-output modeling (an efficiency analysis, which tells how income and jobs are distributed throughout and economy for a given economic impact) has nothing to do with benefit-cost (an efficiency analysis, which estimates how efficient monies are spent on investment activities).

Someone who is unfamiliar with IMPLAN cannot readily perform input-output analysis with IMPLAN. A detailed explanation of every step in building the model and constructing individual resource and activity impact files was not made a part of this appendix. To know the procedural process for running IMPLAN, refer to "IMPLAN Professional User's, Analysis Guide and Data Guide", Minnesota IMPLAN Group, Inc., 1997, which is part of the Process Records of each forest. The Minnesota IMPLAN Group also offers training classes for model usage.

Important assumptions have been documented in the FEAST electronic spreadsheet, which links IMPLAN response coefficients with resource outputs, is part of the Process Records. Data sources have been described in this appendix.

## **DEPENDENCY ANALYSIS**

The IMPLAN model was used to assess the economic dependencies of the planning area. Economic dependency is a way of assessing the strength of regional or local economies. Regional economies generally depend on their exports to sustain most local income and employment. Based on this data,



it is reasonable to estimate economic dependency by examining an area's export base. The export base analysis done for this EIS measured the total contribution of one sector, or industry to the economy. Industries can import and export similar commodities. Those industries having more exports than imports are considered "basic", and thereby allow "new" money to enter the economy. Basic industries allow an economy to grow.

## DIVERSITY ANALYSIS

Using IMPLAN employment and income reports, forest planners illustrated the relative importance of major sectors and industries, such as wood products, and tourism. Employment, industrial output, and total income to workers and proprietors were contrasted to the total for the entire forest economy to gauge the percentage relationship between the two. Using IMPLAN models from two years (1985 and 1996) a change in economic characteristics is illustrated.

The Shannon-Weaver Entropy Indexes were also used to show relative diversity of counties and state. This process allows a relative measure of how diverse a county is with a single number. The entropy method measures diversity of a region against a uniform distribution of employment where the norm is equi-proportional employment in all industries. All indices range between 0 (no diversity) and 1.0 (perfect diversity). These two extremes would occur when there is only one industry in the economy (no diversity) and when all industries contribute equally to the region's employment (perfect diversity). In most cases diversity would be registered somewhere between 0 and 1.0. Another factor affecting the magnitude of the index is the number of industries in a local economy; the greater number the larger the index.

As it is applied to the regional estimate of employment data, the entropy measure of industrial diversity **D** is defined as:

$$D(E_1, E_2, \dots, E_n) = - \sum_{i=1}^n E_i \log_2 E_i$$

where

**n** = the number of industries, and

**E** = the proportion of total employment of the region that is located in the *i*th industry.

The indices contained in these databases have been normalized with respect to the maximum possible index for a given domain of industries (**n**) so that comparisons can be made between indices for 4-, 2- and 1-digit SIC aggregations. As a result, all indices range between 0 (no diversity) and 1.0 (perfect diversity). Specifically, the indices in these databases were computed as:

$$D(E_1, E_2, \dots, E_n) = (- \sum_{i=1}^n E_i \log_2 E_i) / MAX(D(E_1, E_2, \dots, E_n))$$

where

**n** = 528 (4-digit SIC), 70 (2-digit SIC), or 12 (1-digit SIC).

Two important properties of the index are:

(1) The maximum value of **D** is attained when the **E** are all equal. This is the case where the region is totally diversified in the sense that all industries contribute equally to the region's employment. Also, the greater the number of industries sharing the region's economic activity, the greater the value of **D**.

(2)  $D = 0$  when only one of the  $E = 1$  and the remaining are 0. This is an extreme case where the economic activity of a region is concentrated in only one industry; therefore, economic diversity is totally absent.

## FOREST CONTRIBUTION AND ECONOMIC IMPACT ANALYSES

An impact analysis describes what happens when a change in final sales (e.g., exports and residents) occurs for goods and services in the model region. Changes in final sales are the result of multiplying production data (e.g., Metric tons of stone or recreation visitor trips) time sales. Economic impacts were estimated for 2000, using the expenditure data for recreation, wildlife and hunting (U.S. Forest Service's National Visitor Use and Monitoring data, (NVUM), and the Fish and Wildlife Service's wildlife use data, respectively); stumpage estimates for timber, and market prices for minerals (provided by the U.S. Minerals Management Service. Daniel J. Stynes and Eric White, Michigan State University, July 2002, used NVUM data to estimate spending profiles of recreation users. The USDA Forest Service Inventory and Monitoring Institute, Ft. Collins, CO estimated spending profiles from the 1996 U.S. Fish and Wildlife Services wildlife data. Recreation visitor trips were derived as an aggregate of all recreation activities as determined by the 2002 NVUM survey on the Daniel Boone National Forest. From this total amount of trips, the Forest disaggregated recreation into Resident and Non-resident trips for Day Use, Overnight Stay On and Off the National Forest Use.

Impacts to local economies are measured in two ways: employment and total income. Employment is expressed in jobs. A job can be seasonal or year-round, full-time or part-time. The income measure used was total income expressed in 2000 dollars. Total income includes both employee compensation (pay plus benefits) and proprietor's income (e.g., self-employed).

## DATA SOURCES

The planning area IMPLAN models were used to determine total consequences of dollar, employment, and income changes in selected sectors. Because input-output models are linear, multipliers or response coefficients need only be calculated once per model and then applied to the direct change in final demand. A Forest Service-developed spreadsheet known as "FEAST" (Forest Economic Analysis Spreadsheet Tool) was used to import the IMPLAN impact results (response coefficients) to each alternative, expressed in units of output. FEAST transforms the dollar impact for a given industry from IMPLAN to the resource output units, obtained from SPECTRUM (e.g. cc for timber) or other sources such as NVUM for recreation and wildlife use. The multiplication of resource outputs and the IMPLAN response coefficients within FEAST yields a specific employment and dollar output for each resource or activity. Specifications for developing IMPLAN response coefficients and levels of dollar activity are stated below.

## TIMBER

**Sales Data** – Sales data was determined by using timber values multiplied by estimated production levels for each alternative.

**Use of the Model** – Hardwood and softwood sawtimber were processed through the sawmill industry. In the absence of a pulp mill in the local economy roundwood was assumed to be exported

out of the analysis area. Impacts represent the economic activity occurring in all backward linking sectors associated with the final demand output of the timber industries described above.

IMPLAN showed, that for every \$1 million of total timber production in the forest impact area, a given level of dollar value of logs going into the mill result in this impact. Some of this output may be exported and generate new money for the local economy.

## **OTHER RECREATION & WILDLIFE/FISH**

**Expenditure Data** – Recreation and Wildlife and Hunting trips were derived from the National Visitor Use and Monitoring survey, 2002 (NVUM) that is done for one-quarter of national forests each year. The resulting Survey yielded trips for resident and non-resident Day, On National Forest Overnight use, and Off National Forest Overnight Use. These use metrics were entered into FEAST to link with IMPLAN impact response coefficients to yield an impact for recreation and wildlife resources.

While some analysts may not include resident participation in local economy impacts because there may be substitution opportunities for local residents to spend their discretionary dollar, we decided to include resident expenditures in the local economy with the caveat that these expenditures were “associated” with the impacts not “responsible” for causing the impacts. The statement -is made that impacts are “associated” with recreation and wildlife resource impacts rather than “caused” by these impacts because local recreation users have many choices in an impact area for recreation. If some people choose not to recreate on national forest level land, they may recreate in another manner such as go to sporting events or a movie. The dollars would still be spent in the local economy causing a similar impact, but the provider of recreation would be a different party. Local residents are defined as recreation users within 50 miles of the forest boundary.

## **FEDERAL EXPENDITURES & EMPLOYMENT**

**Expenditure Data** –A Forest budget was estimated for each alternative, and these estimates were used for forest expenditures, some of which had local economic effects. Total forest obligations by budget object code for FY 2000 were obtained from the National Finance Center and used to identify total forest expenditures. The proportion of funds spent by program varied by alternative according to the theme for that alternative. The forest staff based on examination of historical Forest Service obligations estimated Forest Service employment.

**Use of the Model** – To obtain an estimate of total impacts from Forest Service spending, salary and non-salary portions of the impact were handled separately. Non-salary expenditures were determined by using the budget object code information noted above. This profile was run through the model for non-salary expenditures per one million dollars, and the results multiplied by total forest non-salary expenditures. FEAST was again used to make the calculations. Local sales to the federal government are treated in the same manner as exports.

Salary impacts result from forest employees spending a portion of their salaries locally. IMPLAN includes a profile of personal consumption expenditures for several income categories; the average compensation for an employee on the Daniel Boone National Forest fell in the category of \$30,000-\$39,999.

## REVENUE SHARING – 25% FUND PAYMENTS

**Expenditure Data** – Until September 30, 2001, Federal law required that 25% Fund Payments be used for only schools or roads or both. A split of 50 percent for schools and 50 percent for roads was used. One profile of expenditures was developed from within the county forest boundary model for 1) the highway construction sector and 2) local educational institutions. Because counties can choose to continue payments under this formula, traditional payments were analyzed (we assumed 50 percent of payments went to roads and 50 percent to education). Should counties choose fixed payments under the new law, the impacts would not vary by alternative. The impact of the fixed payment was not calculated.

**Use of the Model** – The national expenditure profile for state/local government education (schools) and local model estimates for road construction (roads) are provided within IMPLAN. One million dollars of each profile was used to obtain a response coefficient for these Forest Service payments to impact area counties. Sales to local government are treated in the same manner as exports.

## OUTPUT LEVELS

Output levels for each item listed above can be viewed in various Forest FEAST spreadsheet files contained in the process records. These amounts are also located in the corresponding resource sections of the FEIS.

The following Prices were used in the Impact analysis:

### In 1998 Dollars

Coal	\$27.11/metric ton
Natural gas	\$2.39/mcf
Crude oil	\$11.67/barrel
Dimension stone	\$3.26/metric ton

	Non-resident	Resident
General hunting	\$100.15/trip	\$12.70/trip
General fishing	\$126.27/trip	\$21.36/trip
Non-consumptive fish & wildlife	\$ 76.70/trip	\$ 9.62/trip
Recreation on NF-Day Trip	\$43.65/trip	\$30.13/trip
Recreation Overnight-Off NF	\$204.70/trip	\$114.58/trip
Recreation Overnight-On NF	\$159.99/trip	\$111.13/trip

**Note:** These prices were inflated to 2000 dollars in the FEAST spreadsheet. 1998 dollars were used in IMPLAN because the basic IMPLAN data was in 1998 dollars.

## FINANCIAL AND ECONOMIC EFFICIENCY ANALYSIS

Financial efficiency is defined as how well the dollars invested in each alternative produce revenues to the agency. Economic efficiency is defined as how well the dollars invested in each alternative produce benefits to society. Present Net Value (PNV) is used as an indicator of financial and economic efficiency.

The Daniel Boone National Forest used a Microsoft Office Excel electronic spreadsheet to calculate PNV for each alternative over a 50-year period. A 4 percent real discount rate, prescribed by Forest Service Handbook (FSH) 1909.17, was used. Decadal and 50 year cumulative present values for

program benefits and costs as well as present net values are the product of this spreadsheet. For each decade, an average annual resource value was estimated, multiplied by 10 years, and discounted from the mid-point of each decade.

The financial values for timber from average 2000 stumpage prices; for minerals from market prices for minerals from the Minerals Management Agency; and prices for recreation and wildlife from RPA updated to 2000 dollars and transformed to NVUM unit measurements. All values are in 2000 constant dollars.

For the recreation and wildlife values, a conversion factor of 1.325 was used to convert from RVDs to "Visits." This factor was determined by taking the average of hours for a site visit on the Daniel Boone National Forest, which was 15.9 hours per site visit. 15.9 was divided by 12 (number of hours in an RVD) to get the value of 1 Visit = 1.325 RVDs. This factor was multiplied by the 1989 price of an RVD. For example, Hunting had a 1989 price of \$33.27/RVD. This was increased by a factor of 1.325 to equal \$44.08/ Visit. This 1989 RPA value per visit was increased to the value of a 2000 visit in 1989 dollars using the predicted annual increase in value of each RPA recreation activity ( $\$44.08 \times (1.0018)^{11} = \$44.96$ ). This price was then inflated by the Gross National Price Deflator to 2000 dollars (a factor of 1.2887) to yield \$57.94/Visit.

The table below displays the economic values that were used for each resource.

**Table B - 17. Economic Benefits and Financial Revenue Values**

Product	Dollar Value <sup>1</sup>
<b>Timber (\$/MCF<sup>2</sup>):</b>	
Saw-softwood	\$405
Saw-hardwood	\$808
Roundwood- softwood	\$5
Roundwood- hardwood	\$5
<b>Minerals:</b>	
Crushed stone (\$/metric ton)	\$3.37
Limestone (\$/metric ton)	\$4.65
Coal (tons)	\$28.01
Natural gas (\$/cubic meter)	\$0.09
<b>Recreation (\$/visit):</b>	
Camping, picnicking, swimming	\$17.47
Mechanical travel, viewing scenery	\$13.48
Winter sports	\$73.72
Resorts	\$37.27
Wilderness (backpacking)	\$37.16
Other recreation	\$107.93
<b>Wildlife (\$/visit):</b>	
Hunting	\$57.94
Fishing	\$115.06
Wildlife watching	\$69.06

<sup>1</sup> Timber values based on Forest harvest values; Recreation and Wildlife values based on non-market values in the USDA Forest Service "Resource Pricing and Valuation Procedures for the Recommended 1990 RPA Program", Mineral value taken from historical prices from the U.S. Minerals Management Service

<sup>2</sup> MCF = thousand cubic feet

## **STAKEHOLDER AND DEMOGRAPHICS ANALYSES**

In recent years, the amount and level of conflict over natural resource issues has increased substantially. As a result, much attention has been devoted to increasing our understanding of the dynamics of these conflicts, what they mean for stakeholders and natural resource managers, and what can be done to help managers and stakeholders better understand each other and work together to find ways to resolve, conflicts before they occur.

We attempted to learn of the values, attitudes and beliefs of the neighbors to the Southern Appalachian forests (including the Daniel Boone national Forest), through a random telephone survey. This survey was published under the title “Public Survey Report, Public Use and Preferred Objectives for Southern Appalachian National Forests” Cordell et al. (2002). Copies are located at [www.srs.fs.fed.us/trends](http://www.srs.fs.fed.us/trends).

# Appendix C

## ROADLESS EVALUATION

**Abstract:** An initial Roadless Area inventory was done on the Daniel Boone National Forest as called for in 36 CFR 219.17 using the guidelines established in Forest Service Handbook 1909.12 Chapter 7, Section 7. The three roadless areas identified in the 1985 Forest Plan need no further action. They either are wilderness, or are no longer within the jurisdiction of the Daniel Boone National Forest, or do not qualify as roadless areas. Twelve additional areas were evaluated against the criteria. Only Wolfpen Creek (Area 2) met the minimum criteria for a roadless area. Wolfpen Creek is immediately adjacent to Clifty Wilderness.

## RE-EVALUATION OF AREAS IDENTIFIED IN THE 1985 PLAN

### Clifty Area

Legislated Wilderness, December 23, 1985, in Kentucky Wilderness Act of 1985, PL 99-197.

### Troublesome Area

This area was part of a transfer of jurisdiction to the Corps of Engineers for the development of the Big South Fork National River and Recreational Area. Transferred to jurisdiction of the Department of the Interior, National Park Service, October 1990.

### Cave Creek Area

This area does not meet the following criteria for Roadless Areas as specified in FSH 1909, Chapter 7, section 7.11b, Criteria for Roadless Areas in the East:

- 1) The area contains no more than one half-mile of improved road for each 1,000 acres, and the road is under Forest Service jurisdiction.
  - 11.25 miles of improved road in a 4,300 acre area = 2.61 miles/thousand acres.
- 2) The area contains only a few dwellings on private lands and the location of these dwellings and their access needs insulate their effects on the natural conditions of federal lands.
  - 1,250 acres (29 percent) of the area is privately owned with numerous private dwellings and access roads through the area.

This area was originally proposed as an “underground” wilderness to protect the cave system. The 1984 evaluation indicated that the 1964 Wilderness Act and the 1975 Eastern Wilderness Act implied that Congress viewed wilderness as a surface area, available to the general public, and did not contemplate an underground area as wilderness. The acts did recognize geological features, such as the Cave Creek Cave, as a part of wilderness.

In addition, Cave Creek Cave has undergone significant human impact. According to the 1964 Wilderness Act, Sec. 2(c), “A wilderness . . . is hereby recognized as an area where the earth and its community of life are untrammelled by man . . .” The act further defines wilderness to mean an area of undeveloped federal land “retaining its primitive character and influence” and which “generally appears to have been affected primarily by the forces of nature.”

Cave Creek Cave is impacted by man in two aspects: 1) there is frequent visitation of the cave system by recreational cavers. Signs of humans use last for a long time in fragile ecosystems of caves; and 2) the seasonal fluctuation of Lake Cumberland, a man-made impoundment, affects the accessibility of portions of the cave, and impacts the cave ecosystem. This fluctuation changes the ecosystem in the cave system frequently.

## **POSSIBLE ROADLESS AREA SURVEY/EVALUATION**

A search was made of the Daniel Boone National Forest for areas to consider as possible Roadless Areas. Twelve areas were delineated for consideration by one of two methods of identification:

- 1) Locating areas identified in the 1991 Recreation Opportunity Spectrum (ROS) inventory as Semi-primitive, Non-motorized and Semi-primitive, Motorized, then expanding these areas to logical borders such as roads or ridge tops.
- 2) A review of the Forest Administrative Maps to locate areas that had few roads shown.
- 3) Once an area was identified, a composite of the topographic maps that covered that area was constructed and the road system shown on the topographic maps was updated and made current as of March 1995, based on input from James Boyd, coordinator of the Forests Transportation Information System.

After delineation, the areas were evaluated based on direction from three sources: FSH 1909, Chapter 7, Section 7.11b -- Criteria for Roadless Areas in the East, effective 8/3/92, Criteria for the Identification of Roadless Area, Information needed for Forest Plan Revision and the Southern Appalachian Assessment, 10/21/94, and the Clarification on Roadless Area Guidelines letter from the Regional Forester, dated March 14, 1995. The results of the evaluation are displayed in Table C - 1.

## **CONCLUSION**

Wolfpen Creek is a roadless area based upon the criteria above. It will be further evaluated for possible recommendation as a wilderness study area.



**Table C - 1. A summary of the evaluation done on the twelve areas considered.**

<b>Area/Name</b>	<b>Approx Acreage</b>	<b>Miles of Improved Roads</b>	<b>Miles/M acres</b>	<b>Comments/Improvements</b>
<b>#1 Clay Lick</b>	4,450	3.42	0.77	Does not meet 0.5 mile/M acres road criteria. Impacted by sight and sound of Cave Run Lake, and State Route 801, both heavily used by motorized traffic.
<b>#2 Wolfpen Ck.</b>	2,834	0	0	2 unimproved roads. Influenced by KY 77 on the west and KY 715 on the south. Bounded by Clifty Wilderness on the East. Heavily used segment of STNRT and trail to Indian Stairway.
<b>#3 Chimney Top</b>	3,895	0	0	Impacted by 9 heavily used trails in RRGGA. Impacted by Mountain Parkway on the south, KY 77 on the west, KY 715 on the north and FDR 10 on the east. Koomer Ridge Campground, Greys Arch Picnic Area and Chimney Top Vista are also in the area. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #4 & 5.
<b>Expanded Areas 2 &amp; 3</b>	10,670	5.00	0.47	Impacted by numerous popular trails of Red River Gorge NRT, Koomer Ridge Campground, Greys Arch Picnic Area, Sky Bridge Picnic Area, Chimney Top Vista and FDR 10. KY Route 715 goes through the middle of this area. Does not meet requirements in FSH 1909.12, Chapter 7, Section 7.11b, #2,4,5.
<b>#4 RRGGA South</b>	2,180	2.28	1.05	Does not meet 0.5 miles/M acres road criteria. Extensive private developments in and on border, including oil wells. Has proposed Tight Hollow RNA in this area. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #2,4,5,8.
<b>#5 Rockbridge Fork</b>	1,280	1.06	0.82	Does not meet 0.5 miles/M acres road criteria. 1.06 miles of County Jurisdiction Road. Impacted by FDR 24, and Mountain Parkway, both heavily used by recreationist. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #4,5.
<b>#6 Mill Creek</b>	2,230	8.78	3.90	Does not meet 0.5 miles/M acres road criteria. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #2,5.
<b>#7 Indian Ck.</b>	1,435	2.30	1.64	Does not meet 0.5 miles/M acres road criteria. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #2,5.
<b>Expanded #7</b>	3,300	7.80	2.36	Does not meet 0.5 miles/M acres road criteria. 1.3 miles of County Road 678. 4-H Camp. Several old coal mine sites in the area. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #2,5.
<b>#8 Cowhorn Ck.</b>	2,304	4.90	2.10	Does not meet 0.5 miles/M acres road criteria. 0.20 miles of county road to Davis Cemetery. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #2,5.
<b>#9 Foster Mtn.</b>	7,220	8.7	1.2	Does not meet 0.5 miles/M acres road criteria. 8.7 miles of County jurisdiction roads. large number of private inholdings and associated access roads. Oil wells present. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #2,5.
<b>#10 Bear Ck.</b>	7,680	15.0	1.9	Does not meet 0.5 miles/M acres road criteria. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #2,5.
<b>#11 Leatherwood Creek</b>	4,370	6.90	1.58	Does not meet 0.5 miles/M acres road criteria. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #2,5.
<b>#12 Sugar Ck.</b>	9,830	9.5	0.96	Does not meet 0.5 miles/M acres road criteria. Extensive road system to access outstanding/reserved mineral rights. Does not meet requirements of FSH 1909.12, Chapter 7, Section 7.11b, #2,5.

Additional Examination in 1999, found no additional areas that would qualify as roadless areas.

## **WOLFPEN ROADLESS AREA**

### **OVERVIEW**

#### **Size**

The Wolfpen area is 2,834 acres in size and includes approximately 75 acres of rugged private land in the southwest corner. The area averages 2.5 miles wide and 2.5 miles long.

#### **Location and Vicinity**

This area is located on the Daniel Boone National Forest, Stanton Ranger District in Menifee County Kentucky. The area is located approximately 40 miles east of Interstate 64 and 10 miles north of the Mountain Parkway. Nearby Kentucky communities are: Stanton to the southwest, Frenchburg to the north and Campton to the southeast. Lexington is approximately 60 miles to the west.

Wolfpen is within the Eastern Broadleaf Forest Province of the Northern Cumberland Plateau Section-Central Escarpment Subsection.

The area is part of the Red River Gorge National Natural Landmark and Geological Area (RRGGA), and is bounded on the east by the 12,646 acre Clifty Wilderness.

#### **Access**

Wolfpen area can be accessed from two-lane, paved State roads that connect to the Mountain Parkway, which in turn, connects to the Interstate Highway system (I-64 to I-75), approximately 40 miles away. State Road 715 lays along the southern boundary of the area and State road 77 bounds the area on the west.

There are two closed, unimproved ridge top roads totaling 2.72 miles lay within this area. One road is used for maintenance of two grassy openings. In addition, 3.4 miles of the Sheltowee Trace National Recreation Trail traverse the southeastern quadrant of this area. This trail is closed to motorized use in this area.

#### **Geography and Topography**

The Wolfpen area is very rugged and mountainous. 50 to 80 foot tall sandstone cliffs along the north south trending, narrow, side drainages of the Red River, characterize it throughout. Breathitt and Lee formations are the predominant geological formations in the area.

The Wolfpen Creek drainage is the largest drainage in the area and is located on the western side of the area. The Gladie Creek drainage is located in the eastern part of the area. A broad ridge top system is in the northeast part of the area.

Elevations range from 900 feet to 1300 feet.

### **Vegetation**

This area is in the Northern Cumberland Plateau Section of the Broadleaf Forest Province. Most of the forest is early to mid successional. The lower slopes, and mid to upper slopes with north or east aspects, are dominated by mixed mesophytic forest species composed of various oaks and hickories, yellow-poplar, beech, mixed pines, hemlock, ash and maple. The upper slopes, and slopes with south or west aspects, are mostly dominated by oaks and mixed pines. The trees average between 50 and 100+ years old. Heavy under stories of mountain laurel or rhododendron are commonly found on the slopes and ridge tops, with rhododendron being on the more moist sites.

The White-haired goldenrod is located in scattered sites along the base of some of the cliff lines. This species is found in no other place in the world than the RRGGA.

### **Current Uses**

The area is primarily used for dispersed recreation activities such as hiking, rock climbing and dispersed camping. The ridges from State Road 77 to Wolfpen Creek have numerous rock climbing routes located on the cliff lines that bound these ridges. In addition, there is some illegal ATV use from private land on the ridge system in the northeast part of this area.

Only minor amounts of fishing occur due to the lack of quality perennial streams. Due to the rugged terrain and lack of openings and habitat diversity, little hunting, which is mostly for deer, occurs in the area except on the broad ridge top area in the northeast part of the area where two grassy openings are located.

Because the area has been part of the RRGGA since its establishment, there has been little timber cutting since the mid-1970s. The only other activity that occurs here other than recreation management is the maintenance two grassy openings and a cultivated field which is part of the Gladie Historic site.

A peregrine falcon hacking project was done two years ago on the western side of the area. No falcons are known to have remained in this area, however.

### **Heritage**

The RRGGA is internationally known for its outstanding prehistoric sites. This area contains the highest concentration of rockshelters and rock art in Eastern North America. Fewer than 300 rock art sites have been recorded east of the Mississippi River. Kentucky leads the Eastern United States in the number of rock art sites (70) and over half of these sites are in the RRGGA. As part of the RRGGA this area has its share of the abundance of prehistoric sites. For example, a site located in the Wolfpen area is one of the earliest sites known in North America where domesticated plants were shown to be a food source for humans. Unfortunately, over the past decades, many of these prehistoric sites have been destroyed or damaged by vandalism or inadvertent dispersed recreation activities.

### **Appearance of the Area and its Surroundings**

Most of this area was cut over in the late 1800's and early 1900's with a little timber cutting occurring up into 1991 when a 35 MBF salvage sale of some storm damage was done. Up until the late 1890's, there was an old home site in the bottom of Wolfpen Creek drainage. Some remnants of an old home place and orchard are still visible. In the 1950's, a 35-acre regeneration sale was carried out and followed up by some pine planting on the site. In 1962, 31 acres of crop tree release was done for yellow-poplar. In 1983, 35 acres were treated by chainsaw for site prep and in the same year, some white pine was under-planted on 24 acres.

Most of the hardwood and pine stands are between 50 and 100+ years old.

Due to its ruggedness and many cliff lines, there has been relatively little management activity in this area. Two closed, unimproved roads access the area on ridge tops from the north. One of the roads is used to access two grassy openings on the broad ridge tops in the northeast part of the area.

The National Forest system lands to the east, west and south have many of the same forest and terrain characteristics of this area. Clifty Wilderness to the east has been a wilderness area since 1985 and contains many of the same characteristics and activities as are found in the Wolfpen area. To the south, is the main body of the RRGGA. It too is characterized by similar terrain and forest conditions but many more trails and some recreational developments can be found here, such as the Gladie Historic site, Sky Bridge and Chimney Top Rock overlook areas. To the west, across State Road 77, rugged National Forest system lands can be found which is not part of the RRGGA.

Private land bounds Wolfpen area to the north. On the ridge tops portions of these properties there are some small farms with some unimproved roads and some cleared pastureland. None of the cleared land is immediately adjacent to the Wolfpen area.

### **Key Attractions**

The scenic quality of the RRGGA's rugged, undeveloped character and its cliff lines, which are known internationally for their rock climbing qualities, make this a very popular area for dispersed recreation activities such as hiking and rock climbing. These recreational activities are somewhat less in the Wolfpen area due to a lack of access into the interior, however there are still opportunities for these activities.

The numerous and very unique heritage sites are internationally known in archeological circles and some of the more important sites in the RRGGA are located in this area. Because of these sites, the RRGGA is being proposed as a National Historic Landmark and as part of this designation, the Wolfpen area will be of more interest to those who desire to protect and enhance heritage resources.

**WILDERNESS CAPABILITY****Natural Integrity and Appearance**

Naturally evolving ecosystem processes are occurring in most places with minimal human influences. Except for the few, localized management activities previously discussed, and the areas of heavier dispersed use, past signs of most human activities continue to deteriorate to the point where they are not visually apparent to the casual observer.

The recreation opportunity spectrum is currently classified as semi-primitive non-motorized. The visual integrity objective is classified as high.

**Opportunity to Experience Wilderness Characteristics**

If added to the Clifty Wilderness, the size of the Wilderness would expand from 12,646 to 15,480 acres. The core of lands where solitude and remoteness can be experienced would also expand. The center of this core would primarily be on both sides of the Gladie Creek area.

Once away from the noise of the roads to the south and west, visitors to the Wolfpen area can find a fairly remote, undeveloped and natural experience because the ruggedness of the area helps to minimize outside influences and because this same ruggedness has kept many potential human activities and developments from affecting the area. Outdoor skills would be required to traverse the area. Map and compass orienteering skills and in some cases rock climbing (using non-fixed anchors) or rappelling skills could be employed to access certain challenging areas. Certainly, the rugged terrain and lack of developed trails would provide a challenging outdoor experience requiring a high degree of self reliance for a variety of dispersed recreational activities.

**SPECIAL FEATURES**

The unique characteristics of this area are previously discussed and are attested to by the fact that it is part of a designated Geological Area and National Natural Landmark. The RRGGA is also going to be proposed as a National Historic Landmark. These classifications are due to the uniqueness of its geology that has produced spectacular clifflines and arches and the importance of its heritage resources. The natural features have produced world class rock climbing opportunities and special habitats that contain species such as the White-haired goldenrod, found no where else in the world than the RRGGA.

**Size, Shape, Boundaries and Manageability**

As previously described, the size, shape and juxtaposition to the Clifty Wilderness make the wilderness preservation of the Wolfpen area practical. The area is bounded on all sides, except for the north, by National Forest System lands. While many of the surrounding lands are similar in character to this area, the State roads to the south and west provide good lines of delineation but add noise to the area. The boundary here should be offset, similar to the offset used on the Clifty Wilderness, to avoid road maintenance impacts. The private land to the north is sparsely settled and rural. Other than some incursions by individuals from this land, including some ATV use, there should be other adverse impacts to the wilderness character of the area. Deeper incursions would be

limited primarily to the ridge top area in the northeast part of the area because the interior areas are very rough and protected by cliff lines. Additional land line establishment and maintenance work would be helpful in better delineating this boundary.

## **WILDERNESS AVAILABILITY**

### **Recreation and Tourism**

As previously described, besides established fixed anchor rock climbing routes, the only recreation development in the area is a portion of the Sheltolee Trace National Recreation Trail in the southeast part of the area. Rock climbing, backpacking and some dispersed camping are the primary recreation activities in the area. If the area were designated as Wilderness the main impact would be the exclusion of new rock climbing routes with fixed anchors.

### **Wildlife**

This area provides habitat for a diversity of wildlife but populations of species that require edge and open areas are few due to the lack of such habitat types. There are no wildlife improvements other than the two grassy openings on the ridge area in the northeast corner of the area. Designation as Wilderness would result in these openings eventually reverting to a forested condition and further impacting species requiring open areas and edge.

### **Timber, Minerals and Grazing**

There are no grazing operations in effect in the area, neither are there any planned.

Because the area is part of the RRGGA, all of the area is unsuitable for timber management. There are no timber activities planned for the area.

Most of the area has outstanding private mineral rights.

### **Water Availability and Use**

This area contains the headwaters of several small streams that feed directly into the Red River Wild and Scenic River. These streams are: Wolfpen Creek, Greasy Branch, Sergeant Branch and Klaber Branch. In addition, the area contains part of the watersheds of Duncan Branch and Gladie Creek. All water coming out of the area is of good quality and expected to remain so if the area is designated as Wilderness.

There are no water storage needs or any existing special use water permit authorizations. Designation as Wilderness should not affect the quantity of water coming from this area.

### **Heritage Resources**

As previously stated this area contains numerous very important heritage resources. Designation should not adversely affect these resources.

### Land Uses

There are no special uses, cemeteries or other authorizations in this area. If it were designated as Wilderness no special use authorizations would be approved that did not comply with Wilderness desired conditions.

### Management Considerations (Fire, Insects/Disease and Non-Federal Lands)

Present fire control techniques would change little if the area were designated as wilderness. Use of hand lines, already required due to the rugged terrain would remain the dominant fire line control method employed. However, the broad ridge area adjacent to the private land in the northeast part of the area is suitable for mechanical control line construction. Designation as Wilderness could pose additional difficulty in controlling fire in this area, including private land protection. However, cliff lines do help restrict movement of fire except in the most extreme conditions.

This area would be susceptible to a gypsy moth invasion, predicted to occur in 3-13 years. Oak decline could be a causal factor in mortality with a gypsy moth invasion in areas where species composition, physiologic age and poor soil conditions reduce tree vigor. Designation as Wilderness would make control of this, or other insect and disease invasion, difficult and result in a loss of many trees, including many on adjacent private land.

### WILDERNESS NEED

The concept of wilderness is multifaceted as envisioned by the authors and framers of the 1964 Wilderness Act. As such, there are a number of factors to consider in assessing the need for additional Wilderness.

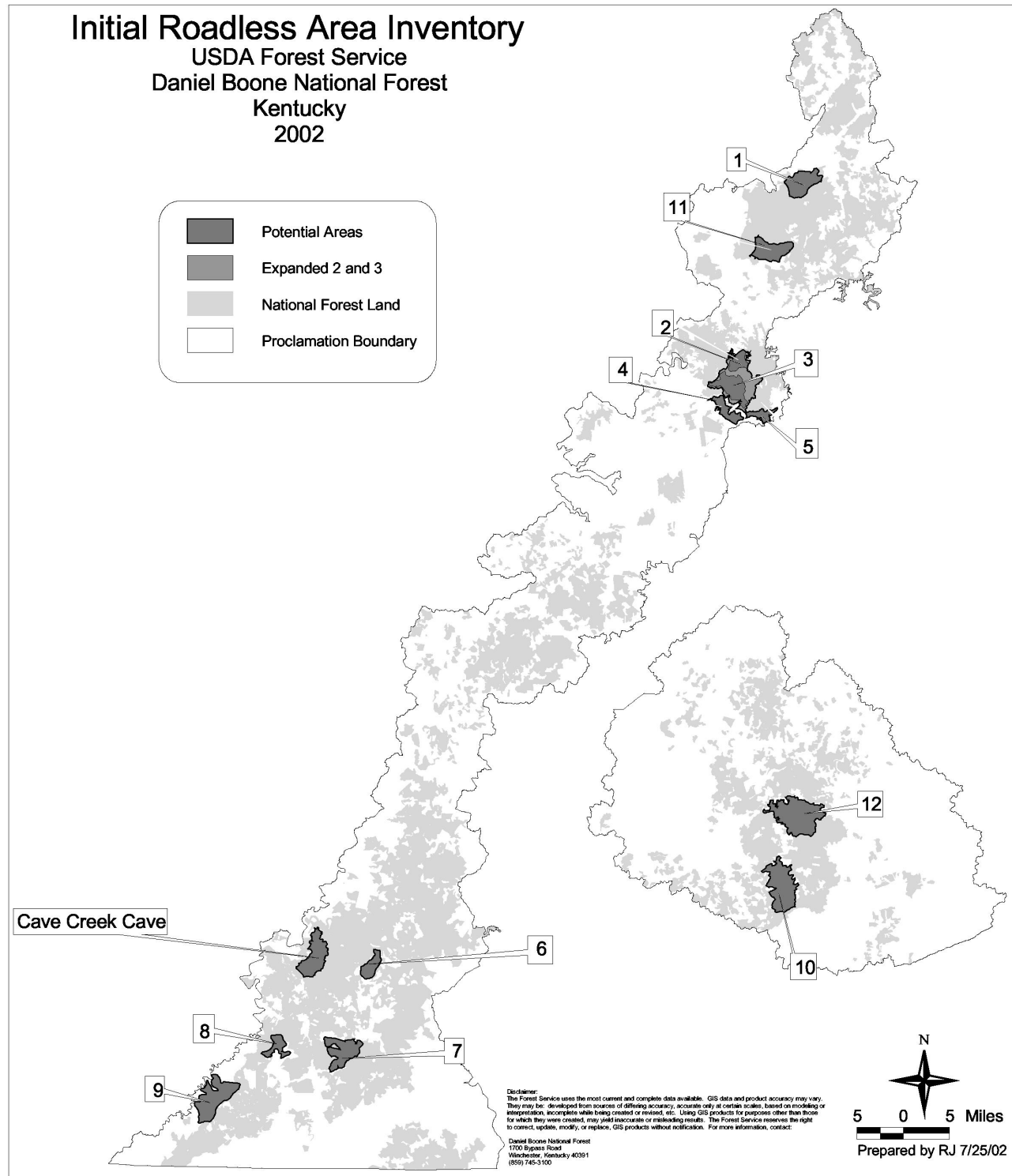
Outdoor recreation is one of the benefactors of wilderness and is one of the drivers of Wilderness demand and Wilderness management. According to trend data collected from 1965 to 1994, the trend in recreation visits to National Forest Wilderness has paralleled designations and increased over time (Cordell 1999). In the Southeast and in the Daniel Boone National Forest Market Area, participation rates and trends in Wilderness indicate an increase in visitation to wilderness. Within a half days travel (250 miles) from the three largest cities in Kentucky, Owensboro and Louisville have 16 Wildernesses and Lexington has 35 Wildernesses. Lexington is adjacent to the Daniel Boone National Forest.

In addition to recreation in Wilderness, there is a non-user component that values Wilderness and is important to understand when analyzing roadless areas, allocations and the need for additional wilderness. Studies have shown that the non-visiting general public values the knowledge that natural environments exist and are protected. This motivation can be considered an existence benefit. The current generation also obtains the off-site benefit of knowing that protection today will provide Wilderness to future generations. Existence and bequest motivations are sometimes referred to as nonuse or passive use benefits. Several studies have shown the importance and value people place on these passive use benefits of Wilderness (Cordell 1999). These values are reflected in the National Survey on Recreation and the Environment (USDA Forest Service 2002c) finding that 69.8% of those surveyed agreed or strongly agreed to the question, "How do you feel about designating more federal lands in your state as wilderness?" Over 96 percent agreed or strongly agreed with the

statement, “ I enjoy knowing that future generations will be able to visit and experience wilderness areas.”

Wilderness is valued for preserving representative natural ecosystems, diversity of landscapes and for research. Currently, the vast majority of the Forest is comprised of the Northern Cumberland Plateau and two subsections (Southwest and Central Escarpment). The Central Escarpment is represented by the 12,646 acre Clifty Wilderness. The 4,791-acre Beaver Creek Wilderness represents the Southwest Escarpment. At the regional/national scale, all of the Forest’s designated Wildernesses and Wolfpen inventoried roadless area lie within the Eastern Broadleaf Forest Province. Cordell (1999) calculated the ratio of Wilderness to ecoregion area to determine representation of Wilderness. The Eastern Broadleaf Forest Province contains 0.1% of the National Wilderness Preservation System (NWPS) area and 3.5% of the total land area in the Continental United States area, yielding a ratio of 0.03. To provide a policy perspective on representation of Wilderness within a Province a ratio of Wilderness to the ecoregion area is calculated. A ratio of at least one would be adequate representation. This indicates that this Province is currently underrepresented in the NWPS.





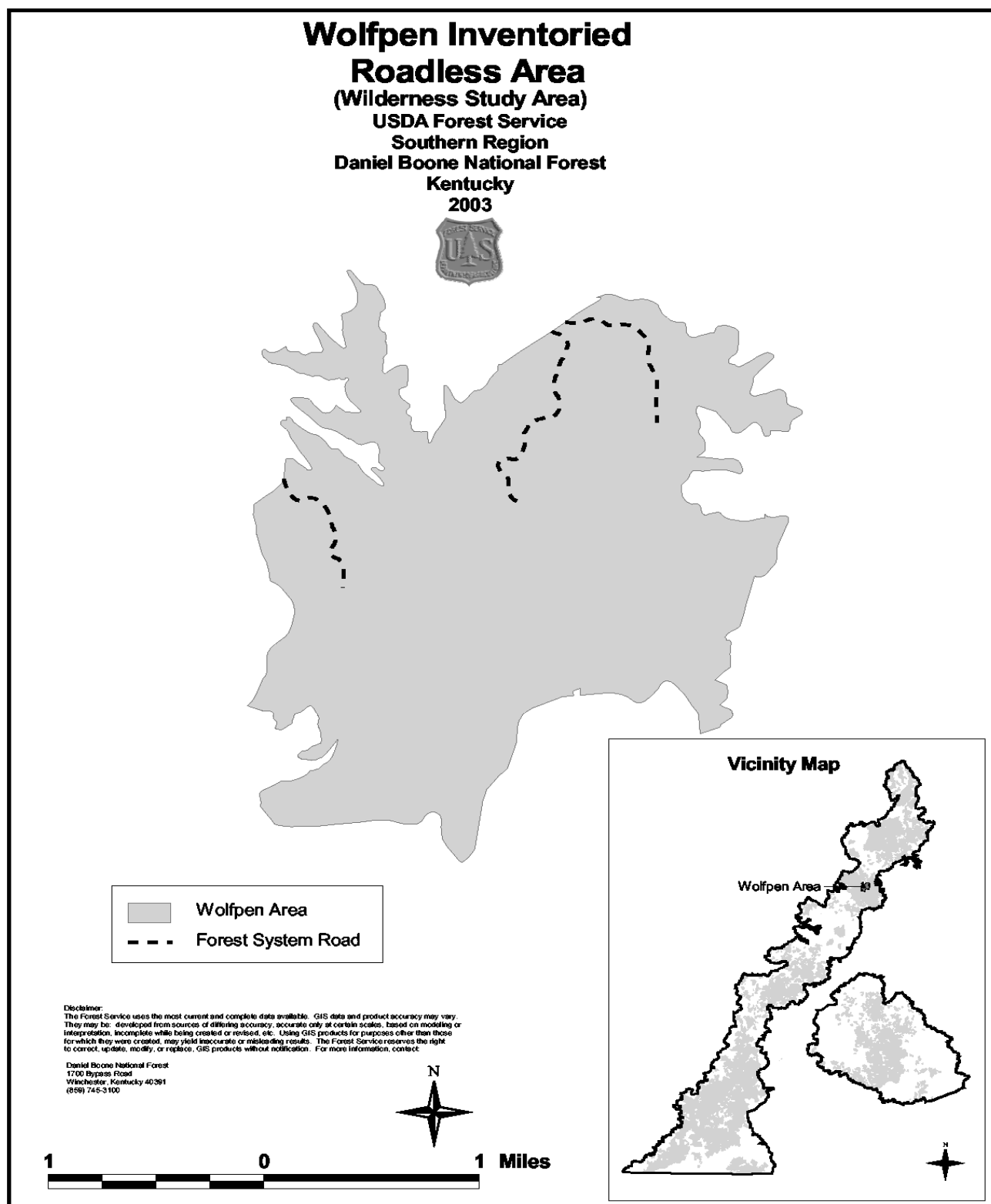
**Figure C - 1. Initial Roadless Area Inventory.**

The public recommends two Areas for wilderness. One recommendation would add all of the Beaver Creek Wildlife management Area to the Beaver Creek Wilderness and the second recommendation was to create a 40,000-acre wilderness in the Jellico Mountain Area. These two areas were evaluated in 1999 and again with the current geographical information system mapping and inventory in 2002. As shown in Table C - 2, Figure C - 3 and Figure C - 4.

**Table C - 2. Summary of the evaluation done on the Beaver Creek and Jellico Mountain recommendations.**

<b>Area/Name</b>	<b>Approx NF Acreage</b>	<b>Miles of Improved Roads*</b>	<b>Miles/ M acres</b>	<b>Comments/Improvements</b>
<b>Beaver Creek Wildlife Management Area Outside Wilderness</b>	12,840	46.6	3.6	Does not meet 0.5 mile/M acres road criteria. Impacted by sight and sound of London Dock and Sam Branch recreation sites on the north. State Route 90 on the south and southeast. Forest collector route 50 on the northwest and forest collector route 46 on the southeast.
<b>All of Jellico Mountain</b>	19,189	55.1	2.9	Does not meet 0.5 mile/M acres road criteria. State Route 1898 bisects area B. Forest route 492 connects with State Route 1898 and 1470. Forest route 498 and 496 connects with State Route 1470 and 1898. Private Land almost bisects area A and B.
<b>Jellico Mountain Without isolated parcels C, D and E.</b>	18,472	56.3	3.0	Does not meet 0.5 mile/M acres road criteria. State Route 1898 bisects area B. Forest route 492 connects with State Route 1898 and 1470. Forest route 498 and 496 connects with State Route 1470 and 1898. Private Land almost bisects area A and B.
<b>Jellico Mountain Area A.</b>	6,596	21.4	3.2	Does not meet 0.5 mile/M acres road criteria. Forest route 492 connects with State Route 1898 and 1470. Forest route 498 and 496 connects with State Route 1470 and 1898.
<b>Jellico Mountain Area B.</b>	11,876	34.9	2.9	Does not meet 0.5 mile/M acres road criteria. State Route 1898 bisects area B. Forest route 492 connects with State Route 1898 and 1470.

\*Only roads within National Forest Boundary are included. Extensive road system services private lands immediately adjacent to National Forest.



**Figure C - 2. Proposed Wolfpen addition to Clifty Wilderness.**

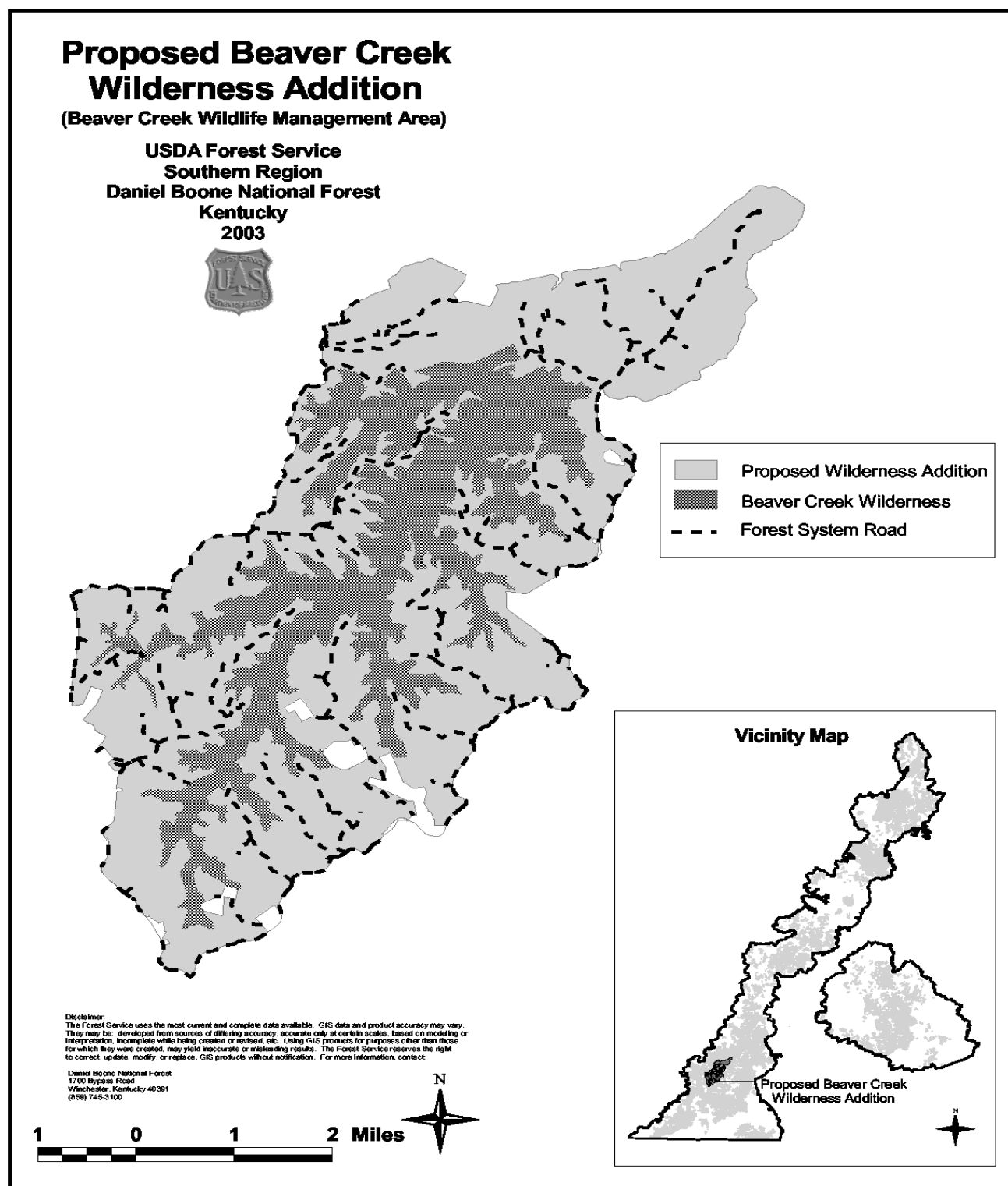


Figure C - 3. Proposed Beaver Creek Wilderness Addition.

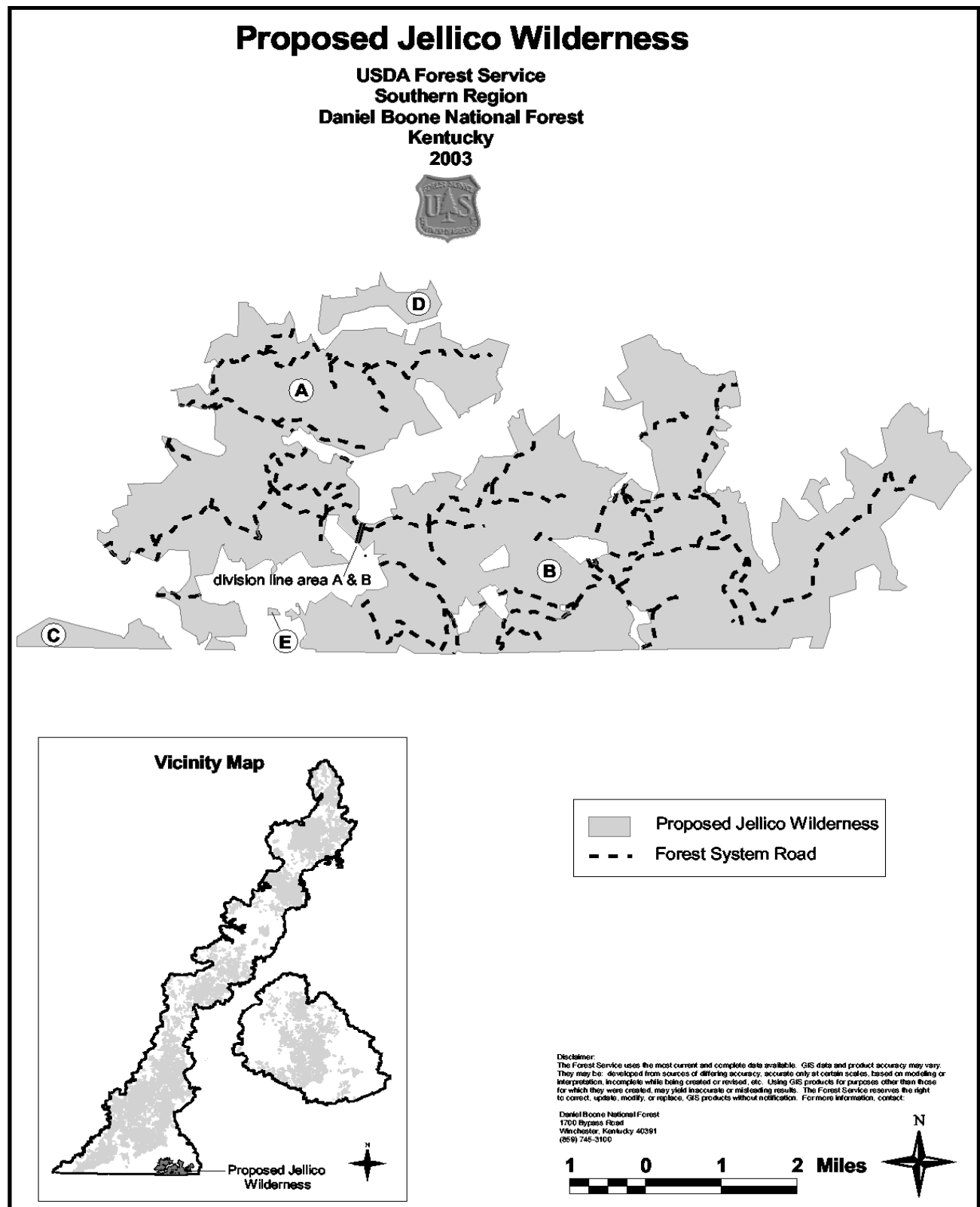


Figure C - 4. Proposed Jellico Wilderness.



Wildflower photography is a popular activity on the Forest

# Appendix D

## WILD AND SCENIC RIVERS ELIGIBILITY

In the Wild and Scenic Rivers Act, Congress called for the preparation and maintenance of a continuing inventory and evaluation of the outdoor recreation needs and resources of the United States and the identification of potential wild, scenic and recreational river areas within the Nation.

The Nationwide Rivers Inventory, compiled by the National Park Service, January 1982, is in response to this direction. It contains a compilation of comprehensive, consistent data on the Nation's significant free-flowing streams. This inventory has been accepted by the Forest Service as an inventory of rivers, which should be addressed in the Land Management Planning process.

The Rivers identified in this inventory were arrived at through the following process. First, all rivers and river segments within the United States, 25 miles or longer, were inventoried and evaluated.

Three general criteria were used in the process:

- The degree to which the river is free flowing
- The degree to which the river and corridor are undeveloped
- The outstanding natural and cultural characteristics of the river and its immediate environment.

After these criteria were applied a preliminary list of selected rivers was circulated for review to Federal and State resource agencies, citizen groups and individuals and meetings were held to revise the list. Further evaluation was done to again refine the list, which was again circulated for further review and final listing.

The river segments on the Daniel Boone National Forest that resulted from the final listing were then chosen for detailed analysis in the 1985 Plan.

In 1996 the Daniel Boone National Forest completed work on a "Final Wild and Scenic River Suitability Study and Environmental Impact Statement for Six Rivers on the Daniel Boone National Forest." The document was then forwarded to the Regional Forester for the Southern Region and, in turn, to the Chief of the Forest Service for review. To date, that review has not been completed and the agency has not forwarded the document to the Deciding Official, the Secretary of Agriculture, consequently, the FEIS has not been released to the public and a Record of Decision has not been issued.

The study and EIS completed by the Daniel Boone found that one of the rivers, the South Fork of Station Camp Creek was not eligible for inclusion in the Wild and Scenic River system and that five rivers are suitable for designation. The suitable segments of those five rivers, Cumberland River, Marsh Creek, Rock Creek, Rockcastle River, and War Fork of Station Camp Creek, have been allocated management direction in the Proposed Revised Forest Plan intended to protect their outstandingly remarkable values and to preserve their suitability for eventual designation.

In 1997 all of the rivers in the Daniel Boone National Forest were re-evaluated and no additional rivers were selected for a suitability analysis.



View near Nada Tunnel in the Red River Gorge on Stanton Ranger District



# Appendix E

## ADDITIONAL TABLES

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## Socioeconomic Tables

**Table E - 1. Race characteristics in Kentucky and in counties containing DBNF managed lands, 1970<sup>1</sup>**

	Persons	White	Black	Other Race	% Minority <sup>2</sup>
<b>State of Kentucky</b>	3,218,706	2,983,375	231,746	3,585	7.31%
<b>Kentucky Counties</b>					
Bath	9,235	8,835	397	3	4.33%
Clay	18,481	18,154	332	0	1.80%
Estill	12,752	12,730	12	10	0.17%
Harlan	37,370	35,084	2,279	7	6.12%
Jackson	10,005	10,005	10	0	0.10%
Knox	23,689	23,330	379	0	1.60%
Laurel	27,386	27,101	246	39	1.04%
Lee	6,587	6,530	46	11	0.87%
Leslie	11,623	11,623	0	0	0.00%
McCreary	12,548	12,353	188	7	1.55%
Menifee	4,050	4,038	20	0	0.49%
Morgan	10,019	10,003	0	16	0.16%
Owsley	5,023	5,023	15	0	0.30%
Perry	25,714	24,970	694	50	2.89%
Powell	7,704	7,642	69	0	0.90%
Pulaski	35,234	34,631	563	40	1.71%
Rockcastle	12,245	12,235	0	10	0.08%
Rowan	17,010	16,782	204	24	1.34%
Wayne	14,268	13,892	370	6	2.64%
Whitley	24,145	23,993	144	8	0.63%
Wolfe	5,669	5,669	0	0	0.00%
<b>Forest County Total</b>	330,757	324,623	5,968	231	1.87%
<b>Forest County Average</b>	15,750	15,458	284	11	1.87%

<sup>1</sup> Data obtained from the U.S. Census Bureau.

<sup>2</sup> % Minority = Black + Other Race/ Persons.

**Table E - 2. Race characteristics in Kentucky and counties containing DBNF managed lands, 1980<sup>1</sup>**

	<b>Persons</b>	<b>White</b>	<b>Black</b>	<b>Other Race</b>	<b>% Minority<sup>2</sup></b>
<b>State of Kentucky</b>	3,660,330	3,379,006	259,477	49,700	8.45%
<b>Kentucky Counties</b>					
Bath	10,025	9,696	319	81	3.99%
Clay	22,752	22,357	347	380	3.20%
Estill	14,495	14,469	13	87	0.69%
Harlan	41,889	39,782	1,927	495	5.78%
Jackson	11,996	11,984	0	137	1.14%
Knox	30,239	29,847	322	373	2.30%
Laurel	38,982	38,588	309	429	1.89%
Lee	7,754	7,712	35	41	0.98%
Leslie	14,882	14,858	6	184	1.28%
McCreary	15,634	15,366	195	225	2.69%
Menifee	5,117	5,050	51	44	1.86%
Morgan	12,103	12,057	21	94	0.95%
Owsley	5,709	5,699	5	59	1.12%
Perry	33,763	33,068	639	355	2.94%
Powell	11,101	10,970	106	82	1.69%
Pulaski	45,803	45,131	564	502	2.33%
Rockcastle	13,973	13,935	3	115	0.84%
Rowan	19,049	18,657	239	264	2.64%
Wayne	17,022	16,612	365	165	3.11%
Whitley	33,396	33,106	205	281	1.46%
Wolfe	6,698	6,686	2	58	0.90%
<b>Forest County Total</b>	412,382	405,630	5,673	4451	2.45%
<b>Forest County Average</b>	19,637	19,316	270	212	2.45%

<sup>1</sup> Data obtained from the U.S. Census Bureau.<sup>2</sup> % Minority = Black + Other Race/ Persons.

**Table E - 3. Race characteristics in Kentucky and counties containing DBNF managed lands, 1990<sup>1</sup>**

	<b>Persons</b>	<b>White</b>	<b>Black</b>	<b>Other Race<sup>2</sup></b>	<b>% Minority</b>
<b>State of Kentucky</b>	3,685,296	3,391,832	262,907	30,557	7.96%
<b>Kentucky Counties</b>					
Bath	9,692	9,393	277	22	3.09%
Clay	21,746	21,329	335	82	1.92%
Estill	14,614	14,593	8	13	0.14%
Harlan	36,574	35,259	1,212	103	3.60%
Jackson	11,955	11,935	2	18	0.17%
Knox	29,676	29,267	291	118	1.38%
Laurel	43,438	42,969	245	224	1.08%
Lee	7,422	7,389	26	7	0.44%
Leslie	13,642	13,611	12	19	0.23%
McCreary	15,603	15,416	124	63	1.20%
Menifee	5,092	4,987	87	18	2.06%
Morgan	11,648	11,533	100	15	0.99%
Owsley	5,036	5,017	14	5	0.38%
Perry	30,283	29,660	521	102	2.06%
Powell	11,686	11,574	82	30	0.96%
Pulaski	49,489	48,671	599	219	1.65%
Rockcastle	14,803	14,760	3	40	0.29%
Rowan	20,353	19,879	309	165	2.33%
Wayne	17,468	17,098	318	52	2.12%
Whitley	33,326	32,997	213	116	0.99%
Wolfe	6,503	6,486	8	9	0.26%
<b>Forest County Total</b>	410,049	403,823	4,786	1,440	1.52%
<b>Forest County Average</b>	19526.14	19229.67	227.9	68.57143	1.52%

<sup>1</sup> Data obtained from the U.S. Census Bureau.<sup>2</sup> % Minority = Black + Other Race/ Persons.

**Table E - 4. Race characteristics in Kentucky and counties containing DBNF managed lands, 2000<sup>1</sup>**

	<b>Persons</b>	<b>White</b>	<b>Black</b>	<b>Other Race<sup>2</sup></b>	<b>% Minority</b>
<b>State of Kentucky</b>	4,041,769	3,640,889	295,994	104,886	9.92%
<b>Kentucky Counties</b>					
Bath	11,085	10,738	205	142	3.13%
Clay	24,556	23,063	1,178	315	6.08%
Estill	15,307	15,165	17	125	0.93%
Harlan	33,202	31,728	869	605	4.44%
Jackson	13,495	13,383	7	105	0.83%
Knox	31,795	31,108	262	425	2.16%
Laurel	52,715	51,484	331	900	2.34%
Lee	7,916	7,528	300	88	4.90%
Leslie	12,401	12,296	9	96	0.85%
McCreary	17,080	16,737	108	235	2.01%
Menifee	6,556	6,401	90	65	2.36%
Morgan	13,948	13,193	611	144	5.41%
Owsley	4,858	4,820	5	33	0.78%
Perry	29,390	28,609	482	299	2.66%
Powell	13,237	13,046	82	109	1.44%
Pulaski	56,217	54,798	604	815	2.52%
Rockcastle	16,582	16,385	23	174	1.19%
Rowan	22,094	21,205	345	544	4.02%
Wayne	19,923	19,321	297	305	3.02%
Whitley	35,865	35,280	123	462	1.63%
Wolfe	7,065	7,011	17	37	0.76%
<b>Forest County Total</b>	<b>445,287</b>	<b>433,299</b>	<b>5,965</b>	<b>6,023</b>	<b>2.69%</b>
<b>Forest County Average</b>	<b>21,204</b>	<b>20,633</b>	<b>284</b>	<b>287</b>	<b>2.69%</b>

<sup>1</sup> Data obtained from the U.S. Census Bureau.<sup>2</sup> % Minority = Black + Other Race/ Persons.

**Table E - 5. Percent minority<sup>1</sup> population for Kentucky and counties containing DBNF land, 1970-2000<sup>2</sup>**

	1970	1980	1990	2000
<b>State of Kentucky</b>	7.31%	8.45%	7.96%	9.92%
<b>Kentucky Counties</b>				
Bath	4.33%	3.99%	3.09%	<b>3.13%</b>
Clay	1.80%	<b>3.20%</b>	1.92%	<b>6.08%</b>
Estill	0.17%	<b>0.69%</b>	0.14%	<b>0.93%</b>
Harlan	6.12%	5.78%	3.60%	<b>4.44%</b>
Jackson	0.10%	<b>1.14%</b>	0.17%	<b>0.83%</b>
Knox	1.60%	<b>2.30%</b>	1.38%	<b>2.16%</b>
Laurel	1.04%	<b>1.89%</b>	1.08%	<b>2.34%</b>
Lee	0.87%	<b>0.98%</b>	0.44%	<b>4.90%</b>
Leslie	0.00%	<b>1.28%</b>	0.23%	<b>0.85%</b>
McCreary	1.55%	<b>2.69%</b>	1.20%	<b>2.01%</b>
Menifee	0.49%	<b>1.86%</b>	<b>2.06%</b>	<b>2.36%</b>
Morgan	0.16%	<b>0.95%</b>	<b>0.99%</b>	<b>5.41%</b>
Owsley	0.30%	<b>1.12%</b>	0.38%	<b>0.78%</b>
Perry	2.89%	<b>2.94%</b>	2.06%	<b>2.66%</b>
Powell	0.90%	<b>1.69%</b>	0.96%	<b>1.44%</b>
Pulaski	1.71%	<b>2.33%</b>	1.65%	<b>2.52%</b>
Rockcastle	0.08%	<b>0.84%</b>	0.29%	<b>1.19%</b>
Rowan	1.34%	<b>2.64%</b>	2.33%	<b>4.02%</b>
Wayne	2.64%	<b>3.11%</b>	2.12%	<b>3.02%</b>
Whitley	0.63%	<b>1.46%</b>	0.99%	<b>1.63%</b>
Wolfe	0.00%	<b>0.90%</b>	0.26%	<b>0.76%</b>
<b>Forest County Total</b>	<b>1.26%</b>	<b>1.95%</b>	1.52%	<b>2.69%</b>
<b>Forest County Average</b>	<b>1.26%</b>	<b>1.95%</b>	1.52%	<b>2.69%</b>

<sup>1</sup> % Minority = Black = Other Race/Persons<sup>2</sup> Data obtained from the U.S. Census Bureau.**Bold** = Increased from last census.

**Table E - 6. Race characteristics in Kentucky and counties containing DBNF managed lands, 2000 and percent change from 1990 to 2000**

	2000				% Change 1990–2000		
	Persons	White	Black	Other Race	% Minority	Population	Minority Population
<b>State of Kentucky</b>	4,041,769	3,640,889	295,994	104,886	9.92%	9.70%	36.6%
<b>Kentucky Counties</b>							
Bath	11,085	10,738	205	142	3.13%	14.40%	16.1%
Clay	24,556	23,063	1,178	315	6.08%	12.9%	258.0%
Estill	15,307	15,165	17	125	0.93%	4.7%	576.2%
Harlan	33,202	31,728	869	605	4.44%	-9.2%	12.1%
Jackson	13,495	13,383	7	105	0.83%	12.9%	460.0%
Knox	31,795	31,108	262	425	2.16%	7.1%	68.0%
Laurel	52,715	51,484	331	900	2.34%	21.4%	162.5%
Lee	7,916	7,528	300	88	4.90%	6.7%	1075.8%
Leslie	12,401	12,296	9	96	0.85%	-9.1%	238.7%
McCreary	17,080	16,737	108	235	2.01%	9.5%	83.4%
Menifee	6,556	6,401	90	65	2.36%	28.8%	47.6%
Morgan	13,948	13,193	611	144	5.41%	19.7%	556.5%
Owsley	4,858	4,820	5	33	0.78%	-3.5%	100.0%
Perry	29,390	28,609	482	299	2.66%	-2.9%	25.4%
Powell	13,237	13,046	82	109	1.44%	13.3%	70.5%
Pulaski	56,217	54,798	604	815	2.52%	13.6%	73.5%
Rockcastle	16,582	16,385	23	174	1.19%	12%	358.1%
Rowan	22,094	21,205	345	544	4.02%	8.6%	87.6%
Wayne	19,923	19,321	297	305	3.02%	14.1%	62.7%
Whitley	35,865	35,280	123	462	1.63%	7.6%	77.8%
Wolfe	7,065	7,011	17	37	0.76%	8.6%	217.6%
<b>Forest County Total</b>	445,287	433,299	5,965	6,023	2.69%	8.59%	150.5%
<b>Forest County Average</b>	21,204	20,633	284	287	2.69%	8.59%	150.5%

<sup>1</sup> Data obtained from the U.S. Census Bureau.<sup>2</sup> % Minority = Black + Other Race/ Persons.**Bold** = Increased from last census.

**Table E - 7. Population changes from 1970 to 2000 for Kentucky and counties containing DBNF land<sup>1</sup>**

	<b>1970 Population</b>	<b>1980 Population</b>	<b>1990 Population</b>	<b>2000 Population</b>	<b>% Change 70-80</b>	<b>% Change 80-90</b>	<b>% Change 1990-2000</b>
<b>State of Kentucky</b>	3,220,711	3,685,296	3,685,296	4,041,769	13.6%	0.7%	9.70%
<b>Kentucky Counties</b>							
Bath	9,235	10,025	9,692	11,085	8.6%	<b>-3.3%</b>	14.40%
Clay	18,481	22,752	21,746	24,556	23.1%	<b>-4.4%</b>	12.9%
Estill	12,752	14,495	14,614	15,307	13.7%	0.8%	4.7%
Harlan	37,370	41,889	36,574	33,202	12.1%	<b>-12.7%</b>	-9.2%
Jackson	10,005	11,996	11,955	13,495	19.9%	<b>-0.3%</b>	12.9%
Knox	23,689	30,239	29,676	31,795	27.6%	<b>-1.9%</b>	7.1%
Laurel	27,386	38,982	43,438	52,715	42.3%	11.4%	21.4%
Lee	6,587	7,754	7,422	7,916	17.7%	<b>-4.3%</b>	6.7%
Leslie	11,623	14,882	13,642	12,401	28.0%	<b>-8.3%</b>	-9.1%
McCreary	12,543	15,634	15,603	17,080	24.6%	<b>-0.2%</b>	9.5%
Menifee	4,050	5,117	5,092	6,556	26.3%	<b>-0.5%</b>	28.8%
Morgan	10,019	12,103	11,648	13,948	20.8%	<b>-3.8%</b>	19.7%
Owsley	5,023	5,709	5,036	4,858	13.7%	<b>-11.8%</b>	-3.5%
Perry	26,259	33,763	30,283	29,390	28.6%	<b>-10.3%</b>	-2.9%
Powell	7,704	11,101	11,686	13,237	44.1%	5.3%	13.3%
Pulaski	35,234	45,803	49,489	56,217	30.0%	8.0%	13.6%
Rockcastle	12,305	13,973	14,803	16,582	13.6%	5.9%	12%
Rowan	17,010	19,049	20,353	22,094	12.0%	6.8%	8.6%
Wayne	14,268	17,022	17,468	19,923	19.3%	2.6%	14.1%
Whitley	24,145	33,396	33,326	35,865	38.3%	<b>-0.2%</b>	7.6%
Wolfe	5,669	6,698	6,503	7,065	18.2%	<b>-2.9%</b>	8.6%
<b>Forest County Total</b>	331,357	412,382	410,049	445,287	24.5%	<b>-0.6%</b>	8.59%
<b>Forest County Average</b>	15,779	19,637	19,526	21,204	24.5%	<b>-0.6%</b>	8.59%

<sup>1</sup> Data obtained from the U.S. Census Bureau.<sup>2</sup> % Minority = Black + Other Race/ Persons.**Bold** = Decrease in population for period.



Table E - 8. Social characteristics of counties with DBNF managed land, 1990

County	% of Children <sup>1</sup> Below Poverty, 1989	Children receiving AFDC, 1992 (a)	Children on Food Stamps, 1992	Students on Free/Reduced Lunch 92-93	Teen Birth Rate/ county Rank out of 120, 1990-1992(a)	Owner Occupied Housing 1990	Housing without Water Service 1990	Housing Units Without Public Sewer 1990	Occupied Housing Lacking Complete Plumbing 1990	Housing Units using, Coal, Coke, or Wood, 1990	Housing Units Without Telephone 1990
Bath	32.7%	19.2%	46.3%	53.1%	30.9 / 3	76.5%	21.1%	79.8%	9.6%	26.3%	20.5%
Clay	47.7%	28.3%	63.9%	74.8%	30.9 / 3	71.6%	55.8%	84.1%	10.9%	32.4%	29.3%
Estill	36.7%	17.7%	44.1%	54.7%	15.5 / 100	74.5%	23.9%	67.4%	10.5%	25.6%	24.6%
Harlan	40.5%	19.1%	47.5%	70.0%	25.9 / 23	70.8%	51.9%	66.2%	6.3%	30.2%	20.0%
Jackson	45.6%	22.5%	51.7%	75.5%	26.2 / 22	77.2%	44.8%	90.5%	16.2%	45.5%	21.5%
Knox	50.5%	26.4%	58.8%	80.1%	28.1 / 12	68.8%	37.1%	74.3%	6.7%	20.4%	21.9%
Laurel	29.7%	15.1%	36.1%	51.8%	18.0 / 78	76.4%	11.0%	80.2%	3.6%	17.1%	15.2%
Lee	47.6%	24.3%	60.5%	71.5%	17.3 / 84	75.1%	38.2%	84.1%	14.0%	36.2%	28.7%
Leslie	41.4%	19.9%	47.9%	70.2%	23.9 / 33	77.6%	77.1%	96.1%	10.4%	42.0%	19.9%
McCreary	56.7%	28.5%	68.9%	80.3%	33.9 / 1	74.7%	22.1%	93.1%	10.2%	47.3%	20.3%
Menifee	42.6%	14.0%	44.6%	66.8%	23.9 / 33	81.8%	68.1%	90.4%	12.6%	45.1%	18.4%
Morgan	46.8%	19.9%	50.0%	67.7%	26.7 / 18	76.5%	83.4%	86.6%	7.0%	40.2%	10.7%
Owsley	64.3%	35.9%	74.6%	90.1%	29.9 / 7	74.7%	46.8%	87.1%	16.8%	49.9%	27.8%
Perry	39.1%	20.2%	52.9%	66.6%	25.2 / 29	75.0%	61.2%	71.0%	7.5%	27.4%	16.9%
Powell	33.1%	16.0%	43.8%	59.1%	19.8 / 66	76.8%	27.7%	62.4%	8.5%	27.7%	29.1%
Pulaski	28.8%	10.6%	29.5%	44.7%	20.1 / 61	75.7%	26.6%	74.1%	4.1%	19.6%	13.0%
Rockcastle	37.7%	14.6%	40.0%	63.9%	26.9 / 17	78.2%	28.2%	71.9%	9.1%	28.5%	24.8%
Rowan	33.3%	8.1%	31.6%	47.7%	15.9 / 97	66.7%	14.2%	56.2%	4.3%	25.6%	15.6%
Wayne	46.2%	18.1%	46.8%	80.6%	32.0 / 2	76.0%	41.8%	72.6%	10.2%	42.9%	22.2%
Whitley	43.4%	18.3%	47.9%	79.3%	26.6 / 19	70.8%	40.1%	64.8%	6.6%	23.4%	17.6%
Wolfe	55.2%	29.6%	63.9%	83.8%	30.0 / 5	74.4%	67.9%	87.0%	13.5%	49.0%	24.3%
<b>KY County with Highest %</b>	Owsley 64.3%	Owsley 35.9%	Owsley 74.6%	Owsley 90.1%	McCreary 33.9%	Edmonson 85.6%	Knott 89.6%	Leslie 96.1%	Breathitt 17.8%	Cumberland 51.7%	Clay 29.3%
<b>KY County with Lowest %</b>	Oldham 7.0%	Oldham 2.4%	Oldham 6.5%	Oldham 16.1%	Hancock 6.4%	Fayette 53.0%	Fayette 0.3%	Fayette 4.8%	Fayette 0.3%	Jefferson 0.6%	Boone 1.7%

<sup>1</sup> Ages 17 and under.<sup>2</sup> Children on Aid to Families with Dependent Children (AFDC) 1992.

Source: Socio-Economic Atlas of Kentucky, University of KY, based on U.S. Census Bureau data.

(c) Teen Birth Rate per 1000 females 12-17 years old 1990-1992/rank

**Table E - 9. Persons per square mile for Kentucky and counties containing DBNF managed lands, 1980 and 1990**

	Area in Square Miles	Population Density		
		1980 Persons/ Square Mile	1990 Persons/ Square Mile	1980-90 Percent Change
<b>State of Kentucky</b>	39,732.3	92.1	92.8	0.7%
<b>Kentucky Counties</b>				
Bath	279	35.9	34.7	-3.3%
Clay	471	48.3	46.2	-4.4%
Estill	254	57.1	57.5	0.8%
Harlan	467	89.7	78.3	-12.7%
Jackson	346	34.7	34.6	-0.3%
Knox	388	77.9	76.5	-1.9%
Laurel	436	89.4	99.6	11.4%
Lee	210	36.9	35.3	-4.3%
Leslie	404	36.8	33.8	-8.3%
McCreary	428	36.5	36.5	-0.2%
Menifee	204	25.1	25.0	-0.5%
Morgan	381	31.8	30.6	-3.8%
Owsley	198	28.8	25.4	-11.8%
Perry	342	98.7	88.5	-10.3%
Powell	180	61.7	64.9	5.3%
Pulaski	662	69.2	74.8	8.0%
Rockcastle	318	43.9	46.6	5.9%
Rowan	281	67.8	72.4	6.8%
Wayne	459	37.1	38.1	2.6%
Whitley	440	75.9	75.7	-0.2%
Wolfe	223	30.0	29.2	-2.9%
<b>Forest County Total</b>	7,371	55.9	55.6	-0.6%
<b>Forest County Average</b>	351	N/A	N/A	N/A

<sup>1</sup> N/A = Not Applicable or Not Available

**Table E - 10. Persons per square mile for Kentucky and counties containing DBNF managed lands, 1990 and 2000**

	Area in Square Miles	Population Density		
		1990 Persons/ Square Mile	2000 Persons/ Square Mile	1990–2000 Percent Change
<b>State of Kentucky</b>	39,732.3	92.8	101.7	9.6%
<b>Kentucky Counties</b>				
Bath	279	34.7	39.7	14.5%
Clay	471	46.2	52.1	12.8%
Estill	254	57.5	60.3	4.8%
Harlan	467	78.3	71.1	-9.2%
Jackson	346	34.6	39.0	12.7%
Knox	388	76.5	81.9	7.1%
Laurel	436	99.6	120.9	21.4%
Lee	210	35.3	37.7	6.8%
Leslie	404	33.8	30.7	-9.2%
McCreary	428	36.5	39.9	9.3%
Menifee	204	25.0	32.1	28.5%
Morgan	381	30.6	36.6	19.6%
Owsley	198	25.4	24.5	-3.4%
Perry	342	88.5	85.9	-2.9%
Powell	180	64.9	73.5	13.3%
Pulaski	662	74.8	84.9	13.5%
Rockcastle	318	46.6	52.1	11.9%
Rowan	281	72.4	78.6	8.6%
Wayne	459	38.1	43.4	13.9%
Whitley	440	75.7	81.5	7.7%
Wolfe	223	29.2	31.7	8.5%
<b>Forest County Total</b>	7,371	55.6	60.4	8.7%
<b>Forest County Average</b>	351	N/A <sup>1</sup>	N/A	N/A

<sup>1</sup> N/A = Not Applicable or Not Available

**Table E - 11. Urban and rural population for Kentucky and counties containing DBNF managed lands, 1980 and 2000<sup>1</sup>**

	1980			1990		
	Urban	Rural	% Rural	Urban	Rural	% Rural
<b>State of Kentucky</b>	1,862,200	1,798,600	49.1%	1,910,325	1,774,971	<b>48.2%</b>
<b>Kentucky Counties</b>						
Bath	0	10,025	100.0%	0	9,692	100.0%
Clay	0	22,752	100.0%	0	21,746	100.0%
Estill	2,889	11,606	80.1%	2,836	11,778	80.6%
Harlan	6,736	35,153	83.9%	5,798	30,776	84.1%
Jackson	0	11,996	100.0%	0	11,955	100.0%
Knox	<b>4,669</b>	<b>25,570</b>	<b>84.6%</b>	<b>5,271</b>	<b>24,405</b>	<b>82.2%</b>
Laurel	<b>4,002</b>	<b>34,980</b>	<b>89.7%</b>	<b>5,757</b>	<b>37,681</b>	<b>86.7%</b>
Lee	0	7,754	100.0%	0	7,422	100.0%
Leslie	0	14,882	100.0%	0	13,642	100.0%
McCreary	0	15,634	100.0%	0	15,603	100.0%
Menifee	0	5,117	100.0%	0	5,092	100.0%
Morgan	0	12,103	100.0%	0	11,648	100.0%
Owsley	0	5,709	100.0%	0	5,036	100.0%
Perry	<b>5,371</b>	<b>28,392</b>	<b>84.1%</b>	<b>5,416</b>	<b>24,867</b>	<b>82.1%</b>
Powell	2,691	8,410	75.8%	2,795	8,891	76.1%
Pulaski	10,649	35,154	76.8%	10,733	38,756	78.3%
Rockcastle	<b>0</b>	<b>13,973</b>	<b>100.0%</b>	<b>2,654</b>	<b>12,149</b>	<b>82.1%</b>
Rowan	<b>7,789</b>	<b>11,260</b>	<b>59.1%</b>	<b>8,357</b>	<b>11,996</b>	<b>58.9%</b>
Wayne	5,677	11,345	66.6%	5,357	12,111	69.3%
Whitley	12,299	21,097	63.2%	11,299	22,027	66.1%
Wolfe	0	6,698	100.0%	0	6,503	100.0%
<b>Forest County Total</b>	62,772	349,610	84.8%	66,273	343,776	83.8%
<b>Forest County Average</b>	2,853	15,891	84.8%	3,012	15,626	83.8%

<sup>1</sup> Source: U.S. Census Bureau**Bold** = Decrease in % Rural from 1980 to 1990

Table E - 12. Income and unemployment rates for Kentucky and counties containing DBNF managed lands, 1980 and 1990<sup>1</sup>

	1980			1990			Real Average Annual Income	
	Jobless %	Per Capita Income	Median Income	Jobless %	Per Capita Income	Median Income	% Change in Per Capita Income 1980-90	% Change in Median Income 1980-90
<b>State of Kentucky</b>	8.0	\$5,973	\$16,444	7.0	\$9,546	\$23,803	0.1%	-0.9%
<b>Kentucky Counties</b>								
Bath	14.8	\$4,309	\$11,584	9.4	\$8,034	\$20,026	1.6%	0.8%
Clay	9.6	\$3,481	\$8,901	9.4	\$6,084	\$14,721	1.0%	0.4%
Estill	11.2	\$4,440	\$12,538	11.0	\$7,474	\$19,223	0.6%	-0.4%
Harlan	9.6	\$4,952	\$13,376	9.4	\$7,502	\$18,158	-0.5%	-1.6%
Jackson	13.5	\$3,560	\$8,823	9.6	\$7,097	\$14,767	2.3%	0.5%
Knox	9.3	\$3,988	\$10,425	8.9	\$7,776	\$15,412	2.1%	-0.7%
Laurel	7.6	\$4,807	\$13,390	7.1	\$8,879	\$20,977	1.5%	-0.1%
Lee	14.9	\$4,004	\$9,506	8.8	\$6,869	\$14,618	0.8%	-0.3%
Leslie	8.1	\$4,055	\$10,728	8.2	\$7,190	\$16,419	1.1%	-0.4%
McCreary	13.5	\$3,226	\$8,746	13.8	\$5,153	\$12,223	0.0%	-1.3%
Menifee	18.5	\$3,698	\$10,971	8.6	\$6,911	\$16,538	1.6%	-0.5%
Morgan	9.4	\$3,976	\$9,114	13.6	\$6,871	\$16,031	0.8%	1.0%
Owsley	12.2	\$2,946	\$7,170	8.7	\$5,791	\$11,110	2.1%	-0.3%
Perry	9.3	\$4,917	\$14,084	9.3	\$7,914	\$19,119	0.1%	-1.6%
Powell	13.9	\$4,218	\$12,532	10.2	\$7,474	\$19,540	1.1%	-0.2%
Pulaski	9.9	\$5,064	\$12,425	8.0	\$9,209	\$21,792	1.4%	1.0%
Rockcastle	9.8	\$3,889	\$10,288	7.5	\$7,630	\$18,144	2.1%	1.0%
Rowan	9.0	\$4,563	\$12,791	6.9	\$7,639	\$19,432	0.5%	-0.5%
Wayne	10.5	\$3,670	\$9,612	8.2	\$6,550	\$15,967	1.2%	0.4%
Whitley	12.2	\$4,673	\$11,823	8.8	\$8,028	\$18,021	0.8%	-0.4%
Wolfe	13.4	\$3,773	\$9,669	14.6	\$5,998	\$12,469	0.0%	-2.1%
<b>Forest County Total</b>	N/A <sup>2</sup>	N/A	N/A	N/A	N/A	N/A	N/A	N/A
<b>Forest County Average</b>	10.9	\$3,919	\$10,386	9.1	\$6,912	\$16,123	1.0%	-0.2%

<sup>1</sup> Source: U.S. Census Bureau    <sup>2</sup> N/A = Not Applicable or Not Available

**Table E - 13. Percent of People of all ages living in poverty for Kentucky and counties containing DBNF managed lands, 1989, 1993, and 1995<sup>1</sup>**

	1989	1993	1995
<b>State of Kentucky</b>	19.0%	<b>19.7%</b>	17.9%
<b>Kentucky Counties</b>			
Bath	27.3%	<b>28.9%</b>	25.7%
Clay	40.2%	<b>40.3%</b>	37.3%
Estill	29.0%	<b>29.5%</b>	26.3%
Harlan	33.1%	<b>33.6%</b>	32.7%
Jackson	38.2%	36.1%	34.8%
Knox	38.9%	37.9%	35.4%
Laurel	24.8%	<b>25.3%</b>	22.7%
Lee	37.4%	<b>39.3%</b>	39.1%
Leslie	35.6%	34.1%	33.3%
McCreary	45.5%	43.8%	41.4%
Menifee	35.0%	31.6%	31.5%
Morgan	38.8%	37.4%	36.3%
Owsley	52.1%	46.4%	<b>46.6%</b>
Perry	32.1%	<b>32.5%</b>	30.4%
Powell	26.2%	<b>28.3%</b>	25.1%
Pulaski	22.7%	<b>23.0%</b>	21.2%
Rockcastle	30.7%	29.7%	27.2%
Rowan	28.9%	27.3%	25.8%
Wayne	37.3%	34.3%	32.0%
Whitley	33.0%	30.6%	<b>30.7%</b>
Wolfe	44.3%	40.0%	38.9%
<b>Average in Forest Counties</b>	34.8%	33.8%	32.1%

<sup>1</sup> Source: 1989 and 1995 U.S. Census Bureau, Small Area Income and Poverty Estimates Program. Data "1998 Kentucky Deskbook of Economic Statistics".

Percent poverty increase from previous year are in **bold**

**Table E - 14. Household data for Kentucky and counties containing DBNF managed lands, 1980, 1990, and 2000<sup>1</sup>**

	Age 65+ Households % Change	Persons per Household			% of All Households Female	
	1980–90	1980	1990	2000	1980	1990
<b>State of Kentucky</b>	13.8%	2.82	2.6	2.5	5.6%	6.3%
<b>Kentucky Counties</b>						
Bath	9.8%	2.88	2.61	2.5	2.9%	5.7%
Clay	6.2%	3.31	2.93	2.6	5.9%	4.8%
Estill	7.4%	2.94	2.71	2.5	4.4%	5.9%
Harlan	2.2%	3.01	2.74	2.5	6.0%	6.3%
Jackson	8.2%	2.97	2.71	2.5	5.0%	4.7%
Knox	6.0%	3.01	2.72	2.5	5.8%	7.5%
Laurel	17.8%	3.02	2.75	2.6	4.6%	5.6%
Lee	-6.6%	2.91	2.65	2.4	5.3%	6.2%
Leslie	7.2%	3.25	2.88	2.5	5.7%	7.2%
McCreary	11.1%	3.16	2.8	2.5	7.4%	8.6%
Menifee	11.8%	3.02	2.68	2.5	4.3%	5.8%
Morgan	1.6%	2.99	2.74	2.5	5.4%	5.4%
Owsley	-5.7%	3.02	2.67	2.5	4.3%	4.9%
Perry	1.2%	3.17	2.83	2.5	5.0%	5.9%
Powell	15.2%	3.12	2.86	2.6	5.9%	6.3%
Pulaski	21.2%	2.79	2.57	2.4	4.7%	5.3%
Rockcastle	8.0%	2.94	2.68	2.5	4.6%	4.7%
Rowan	13.6%	2.72	2.49	2.4	6.0%	6.2%
Wayne	14.7%	2.9	2.66	2.5	5.2%	4.7%
Whitley	5.9%	2.86	2.65	2.5	5.1%	7.9%
Wolfe	-6.6%	2.89	2.63	2.5	7.1%	9.6%
<b>Forest County Total</b>	8.8%				5.3%	6.1%
<b>Forest County Average</b>	8.8%	2.9	2.6	2.5	5.3%	6.1%

<sup>1</sup> Source: U.S. Census Bureau

**Table E - 15. Housing data for Kentucky and counties containing DBNF managed lands, 1980, 1990, and 2000<sup>1</sup>**

	Total Housing Units				Housing Units	
			% of Change		Median Value	
	1990	2000	1980-90	1990-2000	1980	1990
<b>State of Kentucky</b>	1,506,845	1,750,927	10.1%	13.9%	\$34,200	\$50,500
<b>Kentucky Counties</b>						
Bath	4,021	4,994	8.8%	19.5%	\$22,900	\$31,000
Clay	7,930	9,439	11.7%	16.0%	\$40,700	\$56,900
Estill	5,863	6,824	11.7%	14.1%	\$22,500	\$30,400
Harlan	14,735	15,017	-0.5%	1.9%	\$19,600	\$29,400
Jackson	4,895	6,065	12.1%	19.3%	\$18,800	\$26,900
Knox	11,731	13,999	8.4%	16.2%	\$23,100	\$35,300
Laurel	16,923	22,317	19.6%	24.2%	\$32,900	\$46,900
Lee	3,025	3,321	8.1%	8.9%	\$20,200	\$28,400
Leslie	5,038	5,502	3.7%	8.4%	\$13,900	\$24,400
McCreary	6,039	7,405	16.7%	18.4%	\$19,600	\$26,300
Menifee	2,421	3,710	29.6%	34.7%	\$25,800	\$32,600
Morgan	4,562	5,487	5.4%	16.9%	\$30,000	\$36,600
Owsley	2,137	2,247	4.8%	4.9%	\$18,600	\$24,400
Perry	11,565	12,741	2.6%	9.2%	\$21,300	\$34,800
Powell	4,458	5,526	16.6%	19.3%	\$27,700	\$37,400
Pulaski	22,328	27,181	14.3%	17.9%	\$30,800	\$44,600
Rockcastle	5,958	7,353	18.3%	19.0%	\$19,400	\$31,100
Rowan	7,375	8,985	10.9%	17.9%	\$31,500	\$44,400
Wayne	7,791	9,789	8.7%	20.4%	\$22,400	\$30,200
Whitley	13,399	15,288	8.2%	12.4%	\$24,000	\$36,600
Wolfe	2,779	3,264	8.1%	14.9%	\$21,800	\$28,200
<b>Forest County Total</b>	164,973	172,252	10.2%	16.0%		
<b>Forest County Average</b>	7,856	8,202	10.2%	15.9%	\$23,068	\$32,582

<sup>1</sup> Data obtained from the U.S. Census Bureau.



**Table E - 16. Personal income and transfer payments for Kentucky and counties containing DBNF managed lands, 1990 and 1997<sup>1</sup>**

	Per Capita Personal Income			Per Capita Government Transfer Payment		
	1990	1997	% Change	1990	1997	1990-97
<b>State of Kentucky</b>	\$15,085	\$20,570	4.53%	\$2,650	\$4,216	6.86%
<b>Kentucky Counties</b>						
Bath	\$11,055	\$14,876	4.33%	\$2,668	\$4,263	6.92%
Clay	\$9,144	\$13,332	5.53%	\$3,264	\$5,256	7.04%
Estill	\$10,197	\$14,563	5.22%	\$2,992	\$5,188	8.18%
Harlan	\$11,103	\$13,690	3.04%	\$3,427	\$5,848	7.93%
Jackson	\$8,533	\$13,132	6.35%	\$2,775	\$4,820	8.21%
Knox	\$9,713	\$13,118	4.39%	\$2,973	\$4,752	6.93%
Laurel	\$12,366	\$16,478	4.19%	\$2,396	\$3,794	6.79%
Lee	\$9,357	\$12,796	4.57%	\$3,379	\$5,546	7.34%
Leslie	\$9,605	\$14,790	6.36%	\$2,883	\$5,814	10.54%
McCreary	\$7,798	\$11,880	6.20%	\$3,469	\$5,552	6.95%
Menifee	\$8,932	\$13,252	5.80%	\$2,293	\$4,389	9.72%
Morgan	\$8,957	\$11,664	3.84%	\$2,681	\$4,155	6.46%
Owsley	\$8,059	\$12,033	5.89%	\$4,016	\$6,883	8.00%
Perry	\$12,043	\$16,010	4.15%	\$3,238	\$5,657	8.30%
Powell	\$9,891	\$13,517	4.56%	\$2,473	\$3,592	5.48%
Pulaski	\$12,796	\$17,470	4.55%	\$3,092	\$4,986	7.06%
Rockcastle	\$9,894	\$14,129	5.22%	\$2,794	\$4,427	6.80%
Rowan	\$9,871	\$13,765	4.87%	\$2,255	\$3,602	6.92%
Wayne	\$9,327	\$13,527	5.45%	\$2,887	\$4,920	7.91%
Whitley	\$11,304	\$14,830	3.95%	\$3,792	\$5,861	6.42%
Wolfe	\$8,889	\$12,799	5.35%	\$3,504	\$6,054	8.12%
<b>National Forest Average</b>	\$9,492	\$13,257	4.72%	\$2,875	\$4,789	7.18%

<sup>1</sup> Source: U.S. Department of Commerce, Bureau of Economic Analysis, Regional Economic Information System database.

Note: Dollars are in nominal terms (year of occurrence).

**Table E - 17. Employment and unemployment rates for Kentucky and counties containing DBNF managed lands, 1997<sup>1</sup>**

	<b>Civilian Labor Force</b>	<b>Jobless Rate 1997 %</b>
<b>State of Kentucky</b>	1,928,067	5.4%
<b>Kentucky Counties</b>		
Bath	5,518	6.8%
Clay	7,376	9.1%
Estill	6,214	5.3%
Harlan	9,477	13.0%
Jackson	6,784	5.6%
Knox	11,361	9.5%
Laurel	22,046	6.5%
Lee	2,687	6.0%
Leslie	4,504	7.7%
McCreary	6,382	9.7%
Menifee	2,788	9.4%
Morgan	4,902	9.3%
Owsley	1,619	5.3%
Perry	11,754	7.4%
Powell	6,855	7.0%
Pulaski	25,473	5.8%
Rockcastle	6,153	6.0%
Rowan	9,124	5.2%
Wayne	7,927	8.3%
Whitley	14,210	7.3%
Wolfe	3,361	7.8%
<b>County Average</b>	8,023	7.4%

<sup>1</sup> Source: U.S. Bureau of Labor Statistics Local Area Unemployment.

Table E - 18. Diversity of the DBNF analysis area's economy by major industry sector 1985 and 1996<sup>1</sup>

Industry	1985 <sup>2</sup>				1985				1996			
	Industry Output	% of Output	Industry Output	% of Output	Employment	% of Total	Employment	% of Total	Total Income	% of Total	Total Income	% of Total
Agriculture	\$456.6	5.3%	\$12,502.1	2.8%	10,042	7.7%	12,502	6.5%	\$211.8	4.8%	\$229.9	3.8%
Mining	\$1,521.1	17.7%	\$5,030.8	7.9%	11,966	9.2%	5,031	2.6%	\$631.6	14.4%	\$361.1	5.9%
Construction	\$408.3	4.8%	\$12,090.5	6.9%	6,168	4.7%	12,090	6.3%	\$161.8	3.7%	\$299.6	4.9%
Other manufacturing	\$1,896.4	22.1%	\$24,321.3	25.8%	18,105	13.9%	24,321	12.7%	\$629.4	14.4%	\$1,067.8	17.4%
Manufacturing - SIC 24 Lumber & wood products	\$135.9	1.6%	\$4,877.8	3.8%	2,382	1.8%	4,878	2.6%	\$42.3	1.0%	\$145.8	2.4%
Manufacturing - SIC 25 Wood furniture & fixtures	\$38.2	0.4%	\$999.0	0.7%	745	0.6%	999	0.5%	\$15.8	0.4%	\$31.8	0.5%
Manufacturing - SIC 26 Paper & pulp products	\$7.5	0.1%	\$218.0	0.3%	76	0.1%	218	0.1%	\$2.9	0.1%	\$10.0	0.2%
Total manufacturing	\$2,078.1	24.2%	\$60,039.3	30.7%	21,308	16.3%	30,416	15.9%	\$690.4	15.8%	\$1,255.4	20.5%
Transportation & utilities - non-tourism	\$815.3	9.5%	\$8,612.5	10.4%	8,453	6.5%	9,111	4.8%	\$427.5	9.8%	\$630.3	10.3%
Finance, insurance, real estate	\$504.2	5.9%	\$5,419.6	6.5%	4,786	3.7%	5,420	2.8%	\$319.4	7.3%	\$516.2	8.4%
Services - Non-tourism	\$743.3	8.7%	\$36,787.3	14.1%	18,807	14.4%	39,994	20.9%	\$444.1	10.2%	\$961.1	15.7%
Wholesale & retail trade - Non-tourism	\$982.5	11.4%	\$0.0	11.4%	23,736	18.2%	38,824	20.3%	\$516.6	11.8%	\$810.4	13.2%
Recreational related wholesale	\$0.6	0.0%	NA <sup>3</sup>	0.0%	13	0.0%	0	0.0%	\$0.3	0.0%	\$0.0	0.0%
Recreational related retail trade	\$7.2	0.1%	NA <sup>3</sup>	0.1%	212	0.2%	0	0.0%	\$3.9	0.1%	\$0.0	0.0%
Local interurban passenger transit	\$0.0	0.0%	\$0.0	0.1%	0	0.0%	243	0.1%	\$0.0	0.0%	\$4.9	0.1%
Recreation Related Industries												
Air transportation	\$0.5	0.0%	\$173.5	0.0%	5	0.0%	45	0.0%	\$0.2	0.0%	\$2.3	0.0%
Wholesale & retail trade	\$44.0	0.5%	\$15,490.2	0.3%	1,043	0.8%	766	0.4%	\$24.5	0.6%	\$22.5	0.4%
General merchandise stores	\$0.0	0.0%	\$4,863.7	0.1%	0	0.0%	241	0.1%	\$0.0	0.0%	\$4.2	0.1%
Food stores	\$0.0	0.0%	\$6,664.7	0.1%	0	0.0%	330	0.2%	\$0.0	0.0%	\$5.4	0.1%
Eating & drinking	\$24.5	0.3%	\$9,766.3	0.4%	660	0.5%	1,479	0.8%	\$8.2	0.2%	\$18.3	0.3%
Miscellaneous retail	\$0.0	0.0%	\$5,107.8	0.1%	0	0.0%	253	0.1%	\$0.0	0.0%	\$4.7	0.1%
Hotels & lodging places	\$11.8	0.1%	\$0.0	0.1%	384	0.3%	515	0.3%	\$6.3	0.1%	\$7.6	0.1%
Laundry, cleaning & shoe repair	\$1.3	0.0%	\$1,413.8	0.0%	53	0.0%	92	0.0%	\$0.8	0.0%	\$1.2	0.0%
Automobile rental & leasing	\$0.1	0.0%	\$970.8	0.0%	2	0.0%	6	0.0%	\$0.1	0.0%	\$0.2	0.0%
Automobile repair & services	\$8.2	0.1%	\$0.0	0.1%	131	0.1%	115	0.1%	\$3.6	0.1%	\$2.7	0.0%
Amusement & recreation services, N.E.C.	\$0.8	0.0%	\$67.4	0.1%	41	0.0%	206	0.1%	\$0.4	0.0%	\$3.3	0.1%
Total tourism estimate	\$99.0	1.2%	\$1,033.6	1.2%	2,543	1.9%	4,292	2.2%	\$48.4	1.1%	\$77.4	1.3%
Government	\$947.7	11.0%	\$655.6	8.0%	20,839	15.9%	31,406	16.4%	\$894.6	20.5%	\$956.9	15.6%
Other—Miscellaneous	\$25.4	0.3%	\$0.0	0.2%	2,035	1.6%	2,045	1.1%	\$25.4	0.6%	\$24.2	0.4%
<b>Totals</b>	<b>\$8,581.5</b>	<b>100.0%</b>	<b>\$12,609.9</b>	<b>100.0%</b>	<b>130,683</b>	<b>100.0%</b>	<b>191,132</b>	<b>100.0%</b>	<b>\$4,371.6</b>	<b>100%</b>	<b>\$6,122.5</b>	<b>100%</b>

<sup>1</sup> Source: 1985 and 1996 IMPLAN data.<sup>2</sup> Dollars in Millions<sup>3</sup> Data not available. Recreation related wholesale and retail not sectors in 1996 data.

**Table E - 19. Daniel Boone National Forest analysis areas, earnings by sector for each county 1997<sup>1</sup>**

County	Total <sup>2</sup>	Agriculture Services	Construction	Farm	Federal Civilian Government	Federal Military Government	Finance	Manufacturing	Mining	Retail Trade	Services	State & Local Government	Utilities	Wholesale Trade
Bath	\$57.91	\$0.84	\$5.137	\$10.15	\$1.18	\$0.30	\$2.11	\$10.18	\$0.00	\$7.347	\$5.97	\$10.73	\$2.80	\$1.15
Clay	\$131.51	\$0.23	\$2.97	\$2.94	\$13.74	\$0.68	\$3.54	\$17.88	\$7.31	\$18.40	\$25.71	\$29.89	\$6.06	\$2.16
Estill	\$68.50	\$0.16	\$2.29	\$2.93	\$0.75	\$0.46	\$2.51	\$10.80	\$1.81	\$12.56	\$8.11	\$14.90	\$10.00	\$1.20
Harlan	\$289.03	\$0.20	\$8.46	\$0.03	\$4.71	\$1.09	\$7.47	\$5.15	\$118.74	\$25.42	\$45.32	\$45.42	\$16.03	\$10.98
Jackson	\$51.73	\$0.21	\$3.97	\$3.36	\$1.15	\$0.37	\$1.10	\$4.13	\$0.94	\$6.17	\$7.42	\$13.02	\$9.65	\$0.21
Knox	\$189.87	\$1.23	\$8.27	\$1.37	\$6.94	\$0.96	\$7.36	\$36.19	\$8.99	\$29.93	\$35.76	\$35.53	\$11.29	\$6.04
Laurel	\$504.14	\$1.35	\$41.79	\$4.57	\$13.57	\$1.42	\$11.42	\$106.20	\$10.30	\$79.38	\$104.31	\$52.45	\$24.90	\$52.46
Lee	\$39.74	\$0.07	\$1.74	\$0.38	\$0.54	\$0.23	\$1.44	\$3.94	\$2.60	\$7.91	\$7.48	\$9.37	\$2.79	\$1.22
Leslie	\$117.01	\$0.07	\$1.18	\$0.05	\$1.48	\$0.41	\$1.43	\$6.53	\$65.94	\$6.36	\$14.82	\$14.43	\$3.94	\$0.37
McCreary	\$79.33	\$0.29	\$2.05	\$0.29	\$4.18	\$0.49	\$2.09	\$23.04	\$0.20	\$9.19	\$13.01	\$18.51	\$4.36	\$1.62
Menifee	\$21.35	\$0.25	\$0.42	\$2.12	\$2.23	\$0.16	\$0.29	\$2.60	\$0.41	\$3.30	\$3.27	\$5.13	\$1.12	\$0.01
Morgan	\$76.42	\$0.61	\$2.56	\$3.66	\$0.90	\$0.40	\$2.30	\$6.12	\$0.66	\$9.38	\$18.09	\$23.69	\$7.33	\$0.83
Owsley	\$16.40	\$0.15	\$0.65	\$1.00	\$0.53	\$0.16	\$0.35	\$0.35	\$0.45	\$1.65	\$3.04	\$6.40	\$1.63	\$0.02
Perry	\$357.30	\$0.61	\$9.25	\$0.10	\$5.24	\$0.93	\$9.09	\$9.09	\$100.19	\$41.49	\$76.18	\$52.68	\$31.13	\$21.30
Powell	\$75.47	\$0.31	\$3.39	\$1.03	\$1.73	\$0.36	\$1.67	\$23.18	\$0.99	\$11.10	\$7.14	\$14.24	\$8.60	\$1.73
Pulaski	\$563.25	\$2.57	\$28.65	\$11.96	\$6.80	\$1.62	\$19.90	\$119.42	\$2.52	\$79.84	\$129.74	\$75.64	\$51.79	\$32.79
Rockcastle	\$76.79	\$0.40	\$3.82	\$4.57	\$0.98	\$0.46	\$2.38	\$16.17	\$0.18	\$9.86	\$18.58	\$14.50	\$3.45	\$1.42
Rowan	\$200.95	\$0.40	\$10.55	\$2.17	\$3.19	\$0.98	\$4.75	\$14.93	\$0.70	\$24.98	\$57.34	\$67.27	\$6.48	\$7.21
Wayne	\$123.48	\$0.32	\$3.30	\$7.67	\$1.11	\$0.55	\$4.40	\$42.32	\$0.46	\$17.64	\$19.04	\$20.42	\$4.70	\$1.55
Whitley	\$306.66	\$0.70	\$9.03	\$1.14	\$4.60	\$1.05	\$11.46	\$31.91	\$26.14	\$36.36	\$91.37	\$39.32	\$37.59	\$16.01
Wolfe	\$31.81	\$0.03	\$0.66	\$1.69	\$1.07	\$0.21	\$0.49	\$4.96	\$0.06	\$5.15	\$5.70	\$8.82	\$2.05	\$0.89
<b>Forest County Total</b>	<b>\$3,378.66</b>	<b>\$11.03</b>	<b>\$150.15</b>	<b>\$63.21</b>	<b>\$76.54</b>	<b>\$13.30</b>	<b>\$97.56</b>	<b>\$495.12</b>	<b>\$349.60</b>	<b>\$443.43</b>	<b>\$697.42</b>	<b>\$572.38</b>	<b>\$247.70</b>	<b>\$161.20</b>

<sup>1</sup> Source: Woods and Poole Economic and Demographic Data 1997, <http://hdf.itos.uga.edu/> A National Human Dimensions Framework and Database for Conducting Social Assessments

<sup>2</sup> Values in millions of dollars.

**Table E - 20. Net Exports 1985 and 1986**

Commodity	Net Exports— Exports Less Imports		Net Exporting Industries as a Percentage of Total Positive Exporting Industries	
	1985	1986	1985	1986
Agriculture	\$223.2	\$70.8	13.3%	6.8%
Mining	\$1,055.6	\$573.2	63.1%	54.7%
Construction	-\$50.1	-\$101.4	0.0%	0.0%
Other Manufacturing	-\$657.1	-\$645.5	0.0%	0.0%
Manufacturing—SIC 24 Lumber & Wood Products	\$55.0	\$250.7	3.3%	23.9%
Manufacturing—SIC 25 Wood Furniture & Fixtures	\$0.4	\$18.6	0.0%	1.8%
Manufacturing—SIC 26 Paper & Pulp Products	-\$70.3	-\$90.7	0.0%	0.0%
Total Manufacturing	-\$672.0	-\$466.9	0.0%	0.0%
<b>Existing in Tourism Estimate:</b>				
Transportation & Utilities	\$9.9	\$135.5	0.6%	12.9%
Local, Interurban Passenger Transit	-\$2.0	-\$10.8	0.0%	0.0%
Air Transportation	-\$73.7	-\$65.5	0.0%	0.0%
Wholesale & Retail Trade—Non-Tourism	-\$169.9	-\$241.6	0.0%	0.0%
Recreation Related Wholesale Trade	-\$4.4	*	0.0%	0.0%
Recreation Related Retail Trade	-\$10.3	*	0.0%	0.0%
General Merchandise Stores	\$0.0	-\$23.7	0.0%	0.0%
Food Stores	\$0.0	-\$52.0	0.0%	0.0%
Eating and Drinking	-\$63.2	-\$37.0	0.0%	0.0%
Miscellaneous Retail	\$0.0	-\$38.1	0.0%	0.0%
Finance, Insurance, and Real Estate	-\$849.1	-\$1,309.9	0.0%	0.0%
Hotels and Lodging Places	-\$23.3	-\$62.3	0.0%	0.0%
Laundry, Cleaning, and Shoe Repair	-\$6.9	-\$10.8	0.0%	0.0%
Services—Non-Tourism	-\$485.7	-\$926.6	0.0%	0.0%
Automobile Rental and Leasing	-\$32.2	-\$44.1	0.0%	0.0%
Automobile Repair and Services	-\$5.7	-\$34.7	0.0%	0.0%
Amusement and Recreation Services, N.E.C.	-\$15.6	-\$37.2	0.0%	0.0%
Total for Commodities in Tourism Estimate (ex. 433, 447, 456, 465)	-\$237.4	-\$416.3	0.0%	0.0%
Commodities for 433, 447, 456, 465	-\$1,494.8	-\$2,342.7	0.0%	0.0%
Total of Trade in Tourism Estimate**	-\$19.9	-\$36.6	0.0%	0.0%
Government	\$329.2	-\$73.3	19.7%	0.0%
Other—Miscellaneous	-\$159.3	-\$23.7	0.0%	0.0%
<b>Total net trade (exports)</b>	-\$1,005.6	-\$2,780.3	100.0%	0.0%
<b>Total positive trade industries (exports)</b>	\$1,673.3	\$1,048.7		100.0%

\* NOTE: 1996 IMPLAN did not have Recreation Related Wholesale and Retail Trade.

\*\* Positive numbers are net exports and negative numbers are net imports

**Table E - 21. Daniel Boone National Forest analysis areas, resource dependency by sector 2001<sup>1</sup>**

<b>Kentucky Counties</b>	<b>Transfers<sup>2</sup></b>	<b>Farming<sup>3</sup></b>	<b>Government<sup>4</sup></b>	<b>Manufacturing<sup>5</sup></b>	<b>Mining<sup>6</sup></b>	<b>Non- specialized<sup>7</sup></b>	<b>Services<sup>8</sup></b>
Bath	--	--	--	--	--	X	--
Clay	X	--	--	--	X	--	--
Estill	X	--	--	--	--	X	--
Harlan	X	--	--	--	X	--	--
Jackson	X	--	--	--	--	X	--
Knox	X	--	--	--	--	X	--
Laurel	--	--	--	--	--	X	--
Lee	X	--	--	--	--	--	X
Leslie	X	--	--	--	X	--	--
McCreary	X	--	X	--	--	--	--
Menifee	X	--	X	--	--	--	--
Morgan	X	--	--	--	--	X	--
Owsley	X	--	X	--	--	--	--
Perry	--	--	--	--	X	--	--
Powell	--	--	--	--	--	X	--
Pulaski	--	--	--	--	--	--	X
Rockcastle	X	--	--	--	--	X	--
Rowan	--	--	X	--	--	--	--
Wayne	X	--	--	X	--	--	--
Whitley	X	--	--	--	--	--	X
Wolfe	X	--	X	--	--	--	--

<sup>1</sup> Source US Department of Agriculture Economic Research Service

<sup>2</sup> Transfers dependent = Income from transfer payments (federal, state, and local) contributed a weighted annual average of 25 percent or more of total personal income over the past three years.

<sup>3</sup> Farm dependent = Farming contributed a weighted annual average of 20 percent or more of total labor and proprietor income over the past three years.

<sup>4</sup> Government dependent = Government contributed a weighted annual average of 25 percent or more of total labor and proprietor income over the past three years.

<sup>5</sup> Manufacturing dependent = Manufacturing contributed a weighted annual average of 30 percent or more of total labor and proprietor income over the past three years.

<sup>6</sup> Mining dependent = Mining contributed a weighted annual average of 15 percent or more of total labor and proprietor income over the past three years.

<sup>7</sup> Non-specialized = counties not classified as a specialized economic type over the past three years.

<sup>8</sup> Services dependent = Service activities (private and personal services, agricultural services, wholesale and retail trade, finance and insurance, transportation and public utilities) contributed a weighted annual average of 50 percent or more of total labor and proprietor income over the past three years.

**Table E - 22. Payment in lieu of tax payments to Kentucky and counties containing DNBF managed lands. 1990 and 1999<sup>1</sup>**

	Payments		% of Change
	1990	1999	1990-1999
<b>State of Kentucky</b>	\$596,282	\$727,353	22.0%
<b>Kentucky Counties</b>			
Bath	\$7,773	\$11,500	47.9%
Clay	\$30,919	\$45,631	47.6%
Estill	\$1,856	\$3,321	78.9%
Harlan	\$2,419	\$2,530	4.6%
Jackson	\$23,116	\$34,339	48.6%
Knox	\$75	\$0	-100.0%
Laurel	\$25,185	\$37,256	47.9%
Lee	\$2,952	\$5,086	72.3%
Leslie	\$23,657	\$32,730	38.4%
McCreary	\$79,941	\$105,360	31.8%
Menifee	\$18,161	\$27,364	50.7%
Morgan	\$9,378	\$11,675	24.5%
Owsley	\$6,651	\$9,593	44.2%
Perry	\$2,517	\$2,905	15.4%
Powell	\$6,100	\$8,960	46.9%
Pulaski	\$27,331	\$35,851	31.2%
Rockcastle	\$5,086	\$8,506	67.2%
Rowan	\$25,512	\$37,305	46.2%
Wayne	\$21,259	\$21,351	0.4%
Whitley	\$17,379	\$25,870	48.9%
Wolfe	\$6,417	\$9,385	46.3%
<b>Forest County Total</b>	\$343,684	\$476,518	38.7%
<b>Forest County Total as % of State Total</b>	57.6%	65.5%	

Source: U.S. Bureau of Land Management.

**Table E - 23. Percent payments to counties with National Forest lands 1986, 1989, 1992, 1995, 1997<sup>1</sup>**

Counties within DBNF Boundary						% Change
	1986	1989	1992	1995	1997	1986-97
Bath	\$12,591.40	\$12,659.07	\$17,751.62	\$8,347.48	\$12,071.00	-4.1%
Clay	\$52,139.63	\$51,710.37	\$72,514.64	\$34,758.03	\$48,360.28	-7.2%
Estill	\$3,039.45	\$3,055.78	\$4,285.08	\$2,530.14	\$3,501.21	15.2%
Harlan	\$547.48	\$550.43	\$771.85	\$362.93	\$502.24	-8.3%
Jackson	\$38,436.90	\$38,583.82	\$54,879.32	\$26,322.41	\$36,510.07	-5.0%
Knox	\$50.46	\$50.72	\$71.13	\$33.45	\$46.29	-8.3%
Laurel	\$38,916.88	\$40,800.60	\$57,729.30	\$27,762.85	\$39,033.72	0.3%
Lee	\$4,848.93	\$5,353.44	\$7,800.23	\$3,881.54	\$5,370.66	10.8%
Leslie	\$35,746.54	\$36,020.21	\$50,510.62	\$23,583.46	\$32,638.59	-8.7%
McCreary	\$337.19	\$283.87	\$256.91	\$484.96	\$369.10	9.5%
Menifee	\$105,998.74	\$95,393.33	\$133,704.30	\$63,681.09	\$88,221.45	-16.8%
Morgan	\$29,794.46	\$30,191.06	\$43,273.67	\$20,711.18	\$28,877.20	-3.1%
Owsley	\$8,827.89	\$8,875.33	\$12,445.75	\$5,852.14	\$8,098.20	-8.3%
Perry	\$10,927.82	\$11,058.52	\$15,526.42	\$7,300.71	\$10,125.88	-7.3%
Powell	\$1,493.81	\$1,501.84	\$2,106.01	\$990.27	\$1,370.34	-8.3%
Pulaski	\$46.29	\$38.97	\$35.27	\$66.57	\$50.67	9.5%
Rockcastle	\$9,607.86	\$9,660.18	\$13,586.71	\$6,438.35	\$9,213.36	-4.1%
Rowan	\$19,271.63	\$21,231.42	\$30,929.81	\$16,401.17	\$23,021.20	19.5%
Wayne	\$8,410.63	\$8,502.44	\$11,922.85	\$6,312.25	\$9,003.22	7.0%
Whitley	\$42,130.19	\$42,356.60	\$59,614.24	\$28,156.06	\$39,095.63	-7.2%
Wolfe	\$437.71	\$440.07	\$617.10	\$290.16	\$401.53	-8.3%
<b>Forest County Total</b>	<b>\$29,469.25</b>	<b>\$29,385.65</b>	<b>\$40,960.04</b>	<b>\$19,714.13</b>	<b>\$27,333.61</b>	<b>-7.2%</b>

Source: USDA Forest Service, Rocky Mountain Research Station.

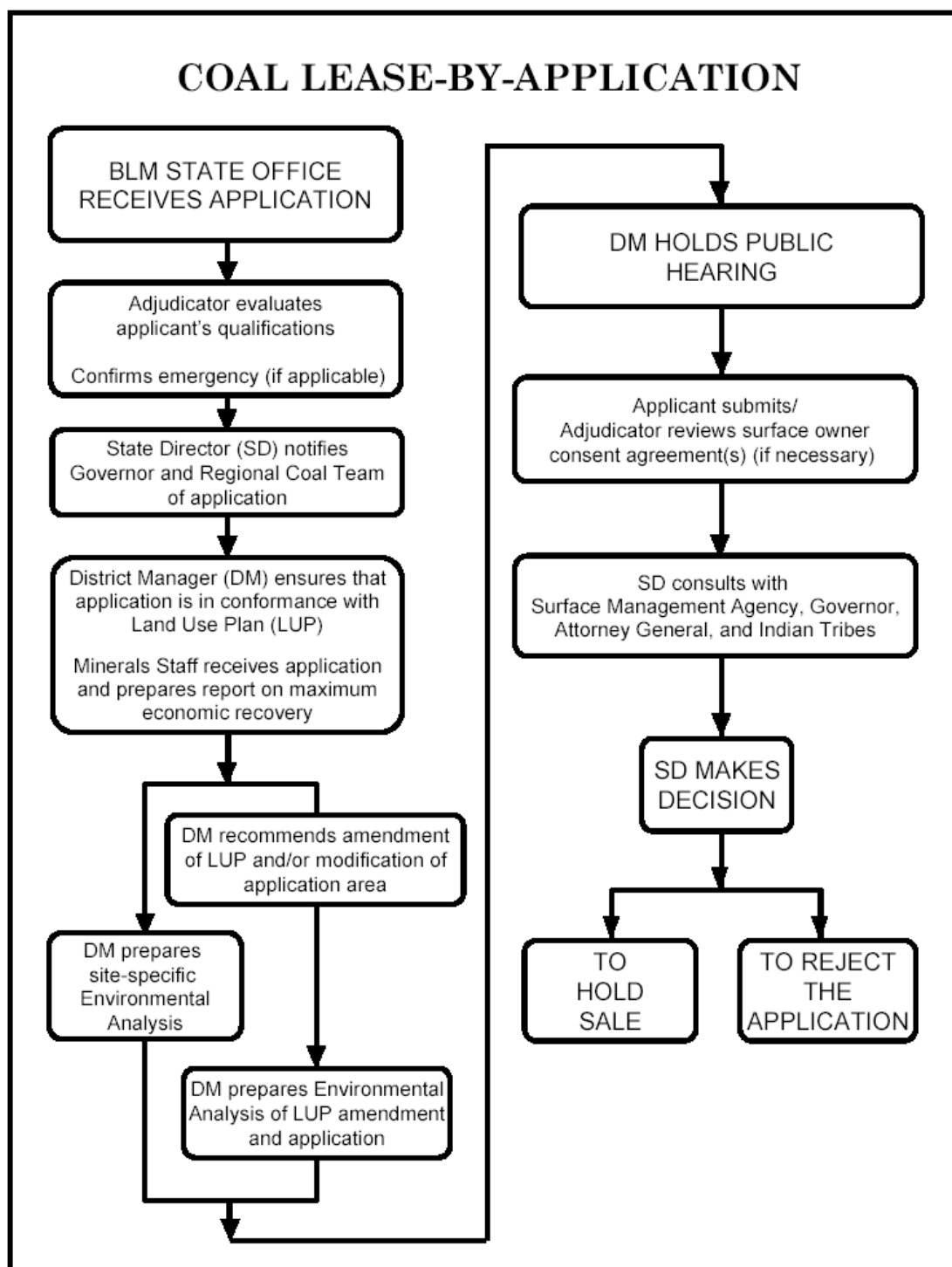


**Table E - 24. Land use types for DBNF counties, 1982 and 1992<sup>1</sup>**

Counties within Proclamation Boundary	County Acres within Proclamation Boundary	% Share							
		Forest		Farm		Urban		Residual	
		1982	1992	1982	1992	1982	1992	1982	1992
Bath	740,840,000	56.9%	51.5%	<b>27.1%</b>	<b>30.9%</b>	<b>0.2%</b>	<b>1.0%</b>	<b>15.8%</b>	<b>16.7%</b>
Clay	1,225,410,000	<b>6.7%</b>	<b>10.6%</b>	64.1%	59.9%	<b>0.9%</b>	<b>1.7%</b>	28.3%	27.9%
Estill	666,260,000	26.9%	26.0%	<b>65.9%</b>	<b>66.1%</b>	<b>0.8%</b>	<b>1.3%</b>	<b>6.4%</b>	<b>6.7%</b>
Harlan	1,262,850,000	0.6%	0.6%	83.7%	77.2%	<b>2.3%</b>	<b>3.0%</b>	<b>13.4%</b>	<b>19.3%</b>
Jackson	900,410,000	<b>16.7%</b>	<b>17.9%</b>	54.8%	53.4%	0.1%	0.1%	<b>28.4%</b>	<b>28.6%</b>
Knox	995,620,000	<b>14.6%</b>	<b>22.7%</b>	74.8%	64.2%	<b>4.3%</b>	<b>5.9%</b>	<b>6.4%</b>	<b>7.1%</b>
Laurel	1,162,090,000	<b>27.7%</b>	<b>28.9%</b>	40.8%	36.8%	<b>3.1%</b>	<b>6.9%</b>	<b>28.4%</b>	<b>27.5%</b>
Lee	549,570,000	12.4%	12.3%	76.6%	75.6%	<b>0.2%</b>	<b>0.5%</b>	<b>10.9%</b>	<b>11.6%</b>
Leslie	1,039,990,000	0.7%	<b>3.3%</b>	72.3%	65.1%	<b>0.8%</b>	<b>1.5%</b>	<b>26.2%</b>	<b>30.1%</b>
McCreary	1,097,630,000	10.3%	5.9%	32.6%	17.9%	<b>1.7%</b>	<b>3.1%</b>	<b>55.4%</b>	<b>73.1%</b>
Menifee	546,220,000	10.2%	10.0%	50.9%	49.5%	0.3%	0.3%	<b>38.6%</b>	<b>40.2%</b>
Morgan	1,022,820,000	<b>19.6%</b>	<b>20.3%</b>	70.8%	67.8%	<b>0.5%</b>	<b>0.7%</b>	<b>9.2%</b>	<b>11.2%</b>
Owsley	512,890,000	<b>13.2%</b>	<b>15.2%</b>	68.4%	66.3%	<b>1.5%</b>	<b>2.9%</b>	17.0%	15.6%
Perry	888,910,000	<b>4.8%</b>	<b>17.2%</b>	79.8%	72.1%	<b>2.6%</b>	<b>4.5%</b>	12.9%	6.2%
Powell	471,120,000	23.3%	22.9%	57.0%	54.7%	<b>2.2%</b>	<b>3.1%</b>	<b>17.6%</b>	<b>19.2%</b>
Pulaski	1,809,700,000	45.0%	44.6%	37.7%	35.3%	<b>3.0%</b>	<b>4.5%</b>	<b>14.3%</b>	<b>15.6%</b>
Rockcastle	817,040,000	<b>34.2%</b>	<b>34.6%</b>	53.2%	50.7%	<b>1.2%</b>	<b>3.1%</b>	<b>11.5%</b>	<b>11.7%</b>
Rowan	763,770,000	<b>16.9%</b>	<b>17.0%</b>	44.0%	43.0%	<b>1.6%</b>	<b>2.8%</b>	37.5%	37.2%
Wayne	1,231,350,000	<b>31.2%</b>	<b>32.9%</b>	59.1%	56.4%	<b>1.5%</b>	<b>2.3%</b>	<b>8.3%</b>	<b>8.4%</b>
Whitley	1,145,540,000	<b>25.1%</b>	<b>30.6%</b>	45.0%	40.2%	<b>3.5%</b>	<b>4.8%</b>	26.4%	24.5%
Wolfe	578,880,000	18.5%	18.4%	66.6%	65.3%	<b>1.2%</b>	<b>1.8%</b>	<b>13.7%</b>	<b>14.5%</b>
<b>Acres Within Forest Boundary</b>	19,428,910,000								
<b>Weighted Average for Forest</b>		<b>20.4%</b>	<b>21.9%</b>	57.3%	53.2%	<b>1.8%</b>	<b>2.9%</b>	<b>20.5%</b>	<b>22.0%</b>

<sup>1</sup>Source: Natural Resource Information System.**Bold** = Increase over the period.

## Mineral Figures and Tables



**Figure E - 1. Flowchart of the Lease by Application Process**

This is primarily a Bureau of Land Management administrative process. The Forest Service is involved as the Surface Management Agency.

**Table E - 25. Criteria (43 CFR 3461.5) for determining the suitability of mineral extraction for sites on the Daniel Boone National Forest**

<b>Criteria</b>	<b>Applicability on the Daniel Boone National Forest</b>
<b>1. Federal Land Systems.</b> With certain exceptions that do not apply to this tract, all federal lands included in the following systems are unsuitable for mining: National Parks, National Wildlife Refuges, National System of Trails, National Wilderness Preservation System, National Wild and Scenic Rivers, National Recreation Areas, Lands Acquired through the Land and Water Conservation Fund, National Forests and federal lands in incorporated cities, towns and villages.	Exception (i) allows for leasing within National Forest lands.
<b>2. Rights-Of-Way and Easements.</b> Federal lands that are within rights-of-way or easements or within surface leases for residential, commercial, industrial or other public purposes, on federally owned surface, are unsuitable for mining.	Exception (i) allows the surface management agency to determine if the type of mining (e.g., underground mining) will not interfere with the items listed in criteria 2.
<b>3. Dwellings, Roads, Cemeteries, and Public Buildings.</b> Federal lands within 100 feet of a right-of-way of a public road or a cemetery; or within 300 feet of any public building, school, church, community or institutional building or public park; or within 300 feet of an occupied dwelling are unsuitable for mining.	The exceptions listed under 43 CFR 3461.5 (c)(2) identify the requirements for mining to occur near the areas listed in these criteria.
<b>4. Wilderness Study Areas.</b> Federal lands designated as wilderness study areas are unsuitable for mining while under review for possible wilderness designation.	The Daniel Boone has two wilderness areas designated, both of which have Federal minerals that are not available for leasing.
<b>5. Lands with Outstanding Scenic Quality.</b> Scenic federal lands designated by visual resource management analysis as Class I (outstanding visual quality or high visual sensitivity) but not currently on National Register of Natural Landmarks is unsuitable.	The Daniel Boone NF does not have areas that are designated Class I for outstanding visual quality. However, areas designated to have scenic value within this plan are protected from surface effects from mineral activity.
<b>6. Land Used for Scientific Study.</b> Federal lands under permit by the surface management agency and being used for scientific studies involving food or fiber production, natural resources, or technology demonstrations and experiments are unsuitable for the duration of the study except where mining would not jeopardize the purpose of the study.	There are some areas that are designated as Research Natural Areas (RNAs) on the Daniel Boone NF. These areas are not to be impacted from the mining of Federal minerals. Reducing the risk from subsidence will be emphasized in these areas.
<b>7. Historic Lands and Sites.</b> All publicly or privately owned places, which are included in or are eligible for inclusion in the National Register of Historic Places and an appropriate buffer zone are unsuitable.	There are lands within the Daniel Boone National Forest that meets these criteria in regards to lands, structures, etc. Where these places occur mining will be stipulated to protect the appropriate buffer zone for the area.
<b>8. Natural Areas.</b> Federal lands designated as natural areas or National Natural Landmarks are unsuitable.	The Daniel Boone NF has one area that is a National Natural Landmark, the Red River Gorge. This area is unsuitable for surface coal extraction.

<p><b>9. Critical Habitat for Threatened or Endangered Plant and Animal Species.</b> Federally designated critical habitat for T or E plant and animal species, and scientifically documented essential habitat for T or E species are unsuitable.</p>	<p>At the plan level of analysis, effects from underground mining are not anticipated to jeopardize the continued existence of Listed species or its critical habitat. All projects will be evaluated for the potential to impact this habitat and decisions on leasing will be based on this evaluation along with other conditions. This statement does not suggest that mining will be allowed to impact critical habitat for T &amp; E species when identified.</p>
<p><b>10. State Listed Species.</b> Federal lands containing habitat determined to be critical or essential for plant or animal species listed by a state pursuant to state law as T or E shall be considered unsuitable.</p>	<p>At the plan level of analysis, effects from underground mining are not anticipated to jeopardize the continued existence of the listed species or its critical habitat. All projects will be evaluated for the potential to impact this habitat and decisions on leasing will be based on this evaluation along with other conditions. This statement does not suggest that mining will be allowed to impact critical or essential habitat for State Listed species when identified</p>
<p><b>11. Bald or Golden Eagle Nests.</b> An active bald or golden eagle nest and appropriate buffer zone are unsuitable unless the lease can be conditioned so that eagles will not be disturbed during breeding season or unless golden eagle nests will be moved.</p>	<p>Surface effects from underground mining are prohibited within ¼ mile of Bald or Golden Eagle nests. Mining of Federal minerals with proposed subsidence or high potential for subsidence will not occur in this zone.</p>
<p><b>12. Bald or Golden Eagle Roosts or Concentration Areas.</b> An active bald or golden eagle nest and appropriate buffer zone are unsuitable unless the lease can be conditioned so that eagles will not be disturbed during breeding season or unless golden eagle nests will be moved.</p>	<p>Surface effects from underground mining are prohibited within ¼ mile of Bald or Golden Eagle roosts or concentration areas. Mining of Federal minerals with proposed subsidence or high potential for subsidence would not occur in this zone.</p>
<p><b>13. Federal lands containing active falcon (excluding kestrel) cliff nesting sites and a suitable buffer zone shall be considered unsuitable unless mining can be conducted in such a way as to ensure the falcons will not be adversely affected.</b></p>	<p>Surface effects from underground mining are prohibited at active falcon cliff nesting sites mentioned in Criteria 13. Underground mining methods should not adversely affect these sites</p>
<p><b>14. Habitat for Migratory Bird Species.</b> Federal lands which are high priority habitat for migratory bird species of high federal interest shall be considered unsuitable unless mining can be conducted in such a way as to ensure that migratory bird habitat will not be adversely affected during the period it is in use.</p>	<p>Due to the underground mining methods allowed within the National Forests, we do not anticipate this activity impacting migratory bird habitat to causing considerable decline in habitat.</p>
<p><b>15. Fish and Wildlife Habitat for Resident Species.</b> Federal lands which the surface management agency and state jointly agree are fish and wildlife habitat of resident species of high interest to the state, and which are essential for maintaining these priority wildlife species, shall be considered unsuitable.</p>	<p>At the plan level of analysis, effects from underground mining are not anticipated to jeopardize the continued existence of fish and wildlife habitat of resident species of high interest to the state. Many of the Prescription Areas address the concern of these species, and have standards in line with the unsuitability of these lands, which are applied to coal development.</p>
<p><b>16. Floodplains.</b> Federal lands in riverine, coastal, and special floodplains shall be considered unsuitable where it is determined that mining could not be undertaken without substantial threat of loss of life or property.</p>	<p>The Daniel Boone NF is not located in an area that coastal floodplain issues are a concern. The Forest will consider floodplains that may pose substantial threat of loss of life or property. At the plan level of analysis, we do not anticipate the relationship of floodplains and underground mining posing a threat of this magnitude on the forest.</p>

<p><b>17. Municipal Watersheds.</b> Federal lands which have been committed by the surface management agency to use as municipal watersheds shall be considered unsuitable.</p>	<p>The Daniel Boone NF has identified areas that are within zones for municipal watersheds. It is our recommendation that areas within zone 1 of the municipal reservoir be designated as “No Surface Occupancy” for oil and gas leasing.</p>
<p><b>18. National Resource Waters.</b> Federal lands with national resource waters, as identified by states in their water quality management plans, and 1/4-mile buffer zones shall be unsuitable.</p>	<p>The Daniel Boone National Forest recognizes the areas of National Resource Waters on the forest. It is our intent in this plan to protect these areas from impact of mining. The areas under the National Resource Waters are unsuitable for mining. The Forest will identify these waters and surface impacts associated with mining will be allowed in these areas.</p>
<p><b>19. Alluvial Valley Floors.</b> All lands identified by the surface management agency, in consultation with the state, as Alluvial Valley Floors where mining would interrupt, discontinue or preclude farming, are unsuitable. Additionally, when mining federal lands outside an AVF would materially damage the quality or quantity of water in surface or underground water systems that would supply Alluvial Valley Floors the land shall be considered unsuitable.</p>	<p>In general, the nature of underground mining would not interrupt, discontinue or preclude farming activities. Impacts to water resources are evaluated prior to reaching a decision on leasing Federal coal. Based upon the finding that a proposal be determined to materially damage quality and quantity of water that supplies Alluvial Valley Floors,</p>
<p><b>20. State or Indian Tribe Criteria.</b> Federal lands to which is applicable a criterion (i) proposed by the state or Indian tribe located in the planning area and (ii) adopted by rulemaking by the Secretary is unsuitable.</p>	<p>At this time, there are no areas that have the designation of being submitted by the State or Indian Tribes and being adopted by the Secretary. The forest provides for the State and Indian Tribes to be involved in the review of our coal leasing projects. All comments are considered at the project level.</p>

43 CFR 3461.2 outlines the 20 unsuitability criteria that are applied in land use planning to areas available for coal leasing. This figure identifies how the criteria apply within the Daniel Boone National Forest.



Creek on Redbird Ranger District

# Appendix F

## PREScription AREAS

### Introduction

A Prescription Area is an allocation of one or more parcels of land within which resource conditions and corresponding management emphasis are similar. Some Prescription Areas describe previous designations; others address current issues and new management emphases.

An alphanumeric system is used to help identify the Prescription Areas. Sequential gaps that occur within the system represent Prescription Areas that were proposed only within Plan Alternatives and not incorporated into this document.

Prescription Area descriptions include:

- Setting (including physical description)
- Desired Future Condition
  - Emphasis of Condition
  - Desired Ecosystem Condition
  - Desired Facilities and Human Activities
- Goals and Objectives
- Standards

Regardless of Prescription Area, Forestwide Goals and Objectives apply, and adherence to Forestwide Standards is mandatory *unless* a prescription-specific Goal, Objective, or Standard supersedes Forestwide Direction. In some cases, Prescription Areas overlap. If Goals and Objectives conflict, a determination of appropriate Desired Future Condition will be made site-specifically. However, the most restrictive Standards must be followed.

The suitability for timber production of each Prescription Area is identified under the “Setting” heading of each Prescription Area. The four classifications used are:

- Unsuitable for Timber Production – Timber harvest not allowed
- Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions
- Suitable for Timber Production (Scheduled Harvest) – Non-timber emphasis
- Suitable for Timber Production (Scheduled Harvest) – Timber emphasis

## Prescription Area Descriptions

### 1.A. ROCK CREEK RESEARCH NATURAL AREA; TIGHT HOLLOW, AND RIGHT FORK OF ELISHA CREEK PROPOSED RESEARCH NATURAL AREAS

#### Setting

This Prescription Area contains 189 acres within the Upper Cumberland River Management Area. Rock Creek Research Natural Area (RNA) is a more or less, cliff-bound valley located on the Rock Creek tributary of the Rockcastle River in southwestern Laurel County. It is located on the London Ranger District. The addition of 469 acres is proposed with the Middle and Upper Kentucky River Management Areas. Tight Hollow is a cliff bound valley located on the Tight Hollow Creek tributary of Mill Creek in southeastern Wolfe County. It is located on the Stanton Ranger District. Right Fork of Elisha Creek is located in the headwaters of the Right Fork of Elisha Creek, a tributary of the Redbird River in west central Leslie County. It is located on the Redbird Ranger District. See the map of Research Natural Areas in Appendix G for an approximate location.

This Prescription Area is classified as Unsuitable for Timber Production – Timber harvest not allowed.

#### Desired Future Condition

**Emphasis of Condition:** A Research Natural Area (RNA) is an “ecological area designated in perpetuity for research and education and/or to maintain biological diversity on National Forest System lands. Research natural areas are “for non-manipulative research, observation, and study.” The Vegetation Management and Protection Research Work Unit of the Southern Forest Experiment Station manages designated areas to maintain biological diversity, conduct non-manipulative research and monitoring, and foster education. Proposed RNAs will be managed by the DBNF until they receive designation.

**Desired Ecosystem Condition:** Rock Creek RNA, established in 1939, is characterized by late-successional or old-growth hemlock and mixed mesophytic forest, with dense rhododendrons along streambanks, large trees, and few forest openings. Rock Creek RNA was also registered as a National Natural Landmark in 1974. Rock Creek RNA has an individual management plan giving specific direction for its Desired Future Condition.

Tight Hollow and Right Fork of Elisha Creek proposed RNAs are currently characterized by mid- to late-successional xeric to mesic forests comprised of upland oak and yellow pine, hemlock and mixed mesophytic forest types. Stands of old-growth are found in these areas. Natural tree gap openings are also present.

All three areas will be moving toward old-growth conditions because of the lack of vegetation management such as tree cutting. Since fire is seldom present in the Rock Creek RNA, upland species such as shortleaf and pitch pines as well as scarlet and chestnut oaks gradually succeed to shade-tolerant species across the majority of the landscape. Snags, natural openings, and large



woody fuels are common. Depending on the research plan, fire may be present in some portions of the proposed Research Natural Areas.

**Facilities and Human Activities:** Roads, trails, or other facilities are not normally found in these areas. Hunting and cross-country hiking may occasionally occur but recreation is not encouraged.

No designated trails occur in the Rock Creek Research Natural Area. Research, when approved by the Southern Research Station, will be non-manipulative. Other activities may include installation of markers for re-measurement of vegetation growth, or other non-destructive sampling. Invasive non-native plants may be controlled. Prescribed fire is not allowed in the Rock Creek RNA and the area is protected from wildland fire.

Designated trails occur in Tight Hollow and Right Fork of Elisha Creek if approved as RNAs only if permitted by the respective management plans. Research, when approved by the Southern Research Station, generally will be non-manipulative. Other activities may include installation of markers for re-measurement of vegetation growth, or other non-destructive sampling. Invasive non-native plants may be controlled. Prescribed fire *may* be allowed in the Tight Hollow and Elisha Creek areas if selected as RNA, based on the respective management plans. The areas are protected from wildland fire.

## Goals and Objectives

**1.A-Goal 1.** Follow direction of and cooperate with the Southern Forest Experiment Station in management of these areas.

**1.A-Objective 1.A.** Management objectives for these areas will be determined by the Southern Forest Experiment Station. The management of Tight Hollow and Right Fork of Elisha Creek proposed Research Natural Areas would be the responsibility of the DBNF until they are designated by the Forest Service Chief to be Research Natural Areas. These two areas are to be managed to retain the values that qualify them to be nominated as Research Natural Areas.

**1.A-Objective 1.B.** The Recreation Opportunity Spectrum objective is Semi-primitive Non-motorized.

**1.A-Objective 1.C.** Reroute existing trails outside of the Research Natural Area, unless approved by the management plan.

## Standards

### LANDS

**1.A-LAND-1.** If Tight Hollow or Right Fork of Elisha Creek is designated as Research Natural Areas, they will remain in this prescription and be managed accordingly.

**1.A-LAND-2.** If the Tight Hollow Proposed Research Natural Area is not designated, its land base will be allocated into Prescription Area 3.E., Red River Gorge Geologic Area and National Natural Landmark.

- 1.A-LAND-3.** If the Right Fork of Elisha Creek Proposed Research Natural Area is not designated a special area, its stands will be inventoried and allocated into Prescription Area 1.I., Designated Old-Growth.

## **MINERALS**

- 1.A-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity; development of federally owned oil and gas is subject to the no surface occupancy stipulation.
- 1.A-MIN-2.** No extraction permits will be issued for common variety minerals, e.g., sand and gravel.

## **WILDLIFE**

- 1.A-WLF-1.** Wildlife improvements must conform to the Research Natural Area management plan.

## **VEGETATION**

- 1.A-VEG-1.** Collection of non-timber forest products is not allowed, except for scientific purposes
- 1.A-VEG-2.** Silvicultural activities must conform to the Research Natural Area management plan.

## **PRESCRIBED FIRE**

- 1.A-FIRE-1.** Prescribed fire control lines must be designed and maintained as directed by the Research Natural Area management plan.

## 1.C. CLIFFLINE COMMUNITY

### Setting

A cliffline community is the area between 100-feet slope-distance from the top and 200-feet slope-distance from the dripline of a cliffline. A cliffline is a naturally occurring, exposed, and nearly vertical rock structure at least 10 feet tall and 100 feet long. A cliffline is continuous if segments are separated by no more than 300 feet. Wherever the described conditions are found, those sites will be included in this Prescription Area.

This Prescription Area, found in all Management Areas, is currently estimated at approximately 111,200 acres across the DBNF.

This Prescription Area is classified as Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

### Desired Future Condition

**Emphasis of Condition:** This area is managed to protect, maintain, or enhance habitat conditions for cliffline associated PETS and Conservation species. Sandstone and/or limestone rock form most of the clifflines on the DBNF.

Microclimate conditions, primarily the temperature and humidity associated with this landscape feature, persist. Overstory trees within this Prescription Area are generally old and usually replaced by natural processes. The forest community within this area varies a great deal because clifflines may occur anywhere on the forest ranging from low elevation streamside areas and higher elevation ridgetops.

**Desired Ecosystem Condition:** This area is managed to maintain its unique ecosystem and to support habitat for viable populations of the flora and fauna that are cliffline associated. Clifflines also function as travelways for many forest species and serve to maintain connectivity between other habitat areas. This ecosystem contains diverse transition zones, from dry to xeric above the cliff, to mesic or riparian communities below. Old trees are often found both above and below clifflines. Depending on the specific location these trees may be fairly widely scattered or heavily stocked. Prescribed fire is allowed in this area and trees may show occasional scorch marks. Non-native, invasive species do not occur within the Cliffline Community Prescription Area.

Dry to xeric forest communities above clifflines are dominated by yellow pine and oak forest types on sandstone cliffs, and a mixture of oaks, other hardwoods and redcedar on limestone cliffs. Below sandstone cliffs, in sheltered areas, such as east or north facing slopes, large hemlock and yellow-poplar trees may dominate the overstory vegetation. More exposed areas facing south and west below sandstone cliffs may be dominated by mixed oak and other hardwoods or by mixed oak and yellow pines. Below limestone cliffs, oaks tend to dominate the forest, however, in more sheltered areas, large sugar maples, yellow-poplars, hemlocks and yellow buckeyes may dominate.

Clifflines often have seasonal, or ephemeral, wet driplines containing both flora and fauna that require such environments. Cave openings and rockshelters are common in this area. Many species of bats and other small animals inhabit dark areas and caves at various points along these cliffs. In

the Red River Gorge Geological Area, white-haired goldenrod may be found in rockshelters along the base of clifflines.

**Desired Facilities and Human Activities:** Where PETS species, habitat for Conservation species, and heritage resources are adequately protected, an occasional trail or stairway may allow access across clifflines. The rich heritage resources occurring here are evaluated and protected, but institutional research is authorized only by written agreement. Dispersed recreation (e.g., hiking, rock climbing, rappelling, bouldering, and camping) is generally allowed, unless adverse impacts to PETS species, habitat for Conservation species, or heritage resources listed or potentially eligible for listing on the National Register of Historic Places, cannot be mitigated.

## Goals and Objectives

**1.C-Goal 1.** Maintain the physical and microclimate conditions so that habitat for species within this uniquely important ecosystem persists on the Forest over the planning period. Manage clifflines to maintain their ecosystems, thereby protecting habitat for flora and fauna species that require these ecosystems.

**1.C-Objective 1.A.** Develop a comprehensive, Forestwide plan for managing cliffline-related recreational activities.

**1.C-Goal 2.** Bring about the delisting of white-haired goldenrod.

**1.C-Objective 2.A.** Complete recovery plan recommendations relating to white-haired goldenrod sites.

**1.C-Objective 2.B.** Participate in the delisting procedure for white-haired goldenrod.

**1.C-Goal 3.** Manage clifflines, including rockshelters, to protect and allow study of the rich archaeological deposits frequently found in this area. Respect Native American values and protect traditional heritage properties whenever possible.

**1.C-Objective 3.A.** Initiate a site-stabilization program for known archaeological sites, in consultation with the State Historic Preservation Officer and interested federally recognized tribes.

**1.C-Objective 3.B.** Initiate a data recovery plan for significant archaeological sites that cannot be adequately protected.

## Standards

### MINERALS

**1.C-MIN-1.** In the area above the cliffline, the surface is not to be disturbed during any federal mineral exploration or development activity; development of federally owned oil and gas is subject to the no surface occupancy stipulation. In the area below the cliffline, surface occupancy is authorized only when these activities will not negatively impact PETS species, habitat for Conservation species, or heritage resources listed or potentially eligible for listing on the National Register of Historic Places; in addition, development of federally owned oil and gas is subject to the controlled surface use stipulation.

### ROADS/ENGINEERING

**1.C-ENG-1.** Subject to valid existing rights, new roads or rights-of-way will not be permitted in the cliffline zone, if they are likely to negatively impact PETS species, habitat for Conservation species, or heritage resources listed or potentially eligible for listing on the National Register of Historic Places.

### RECREATION

**1.C-REC-1.** New recreation facilities will not be permitted in the cliffline zone if they are determined to negatively impact heritage resources listed or potentially eligible for listing on the National Register of Historic Places.

**1.C-REC-2.** Any new areas developed for cliffline related recreation activities, e.g. rock climbing, bouldering, or rappelling, must receive Forest Service authorization prior to development. Improvements to existing developments that may substantially increase use of a cliffline related area must also receive prior authorization from the Forest Service. Activities that constitute development include, but are not limited to:

- a) Permanent installation of safety devices such as bolts, straps, cam devices, or chocks
- b) Construction of access trails
- c) Clearing of vegetation

**1.C-REC-3.** Camping is not permitted within 100 feet of the base of any cliff or the back of any rockshelter, unless at a designated site.

**1.C-REC-4.** No campfire or stove fire is permitted within 100 feet of the base of a cliff, or the back of any rockshelter, unless at a designated site.

**1.C-REC-5.** Areas will be managed to meet or exceed the Recreation Opportunity Spectrum experiences defined as semi-primitive non-motorized, semi-primitive motorized, and roaded natural.

**WILDLIFE**

- 1.C-WLF-1.** Permit site-specific vegetative manipulation only when its purpose and need is to improve or sustain habitat for PETS species or habitat for Conservation species.
- 1.C-WLF-2.** Management activities will not concentrate public use in the vicinity of clifflines, if such is detrimental to PETS species or habitat for Conservation species.
- 1.C-WLF-3.** Protect peregrine falcon aerie (nesting) sites from human disturbance between February 1 and June 30. Determine size of these protection areas, based on terrain and activities known to occur near the nest site, in consultation with the Kentucky Department of Fish and Wildlife Resources.

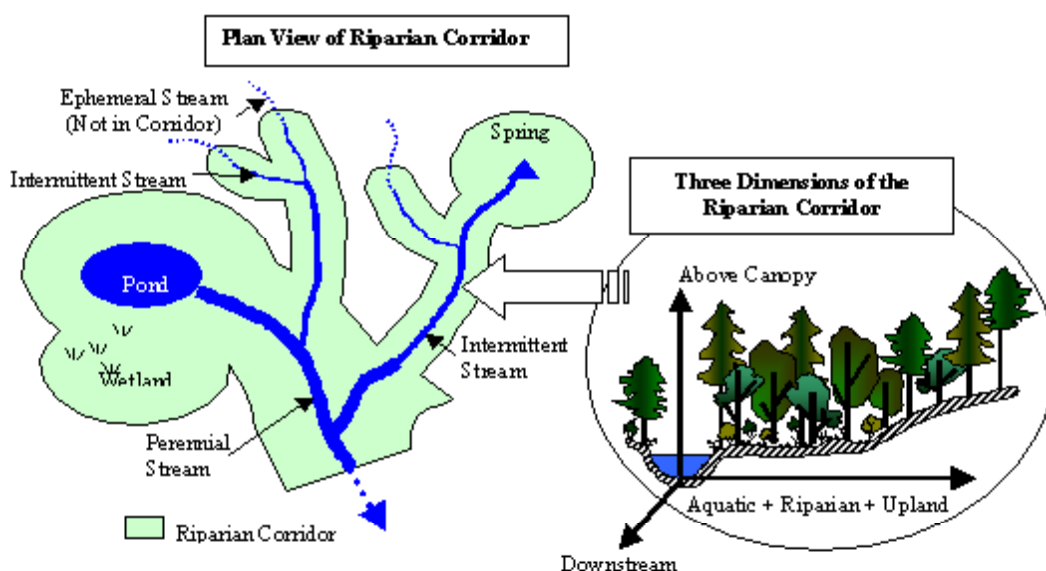
**VEGETATION MANAGEMENT**

- 1.C-VEG-1.** Allow harvest of wood products only as an output in pursuing other resource objectives.
- 1.C-VEG-2.** When timber is harvested, heavy equipment such as skidders or yarders are not to be allowed in this area. Cable logging corridors may cross this area when cable operations are necessary for the management of the cliffline or adjacent Prescription Areas, only when no other reasonable access is available. Logs may be end-lined or cabled from or through this area.
- 1.C-VEG-3.** Collection of non-timber forest products within 50 feet of a cliffline is subject to the following restrictions:
  - a) Personal use moss collection is prohibited.
  - b) Collection of other species within this zone is limited to those species that cannot be feasibly collected elsewhere (e.g., no collection of mountain laurel is allowed within cliffline areas because it can be collected on other upland or midslope sites.)
  - c) For ground disturbing activities (transplants, root digging, etc.) a maximum of 10 plants will be allowed per permit, with no more than two permits sold to an individual per year.
  - d) Non-destructive activities (seed collection, cuttings, etc.) are allowed for all species unless otherwise prohibited.

## 1.E. RIPARIAN CORRIDOR

### Setting

The Riparian Corridor Prescription Area encompasses riparian areas, as well as adjacent associated upland components. A riparian area is functionally defined as a three-dimensional ecotone of interaction that includes both terrestrial and aquatic ecosystems. It is identified on the ground as one of the following: a perennial stream or other perennial water body (with the exception of artificial upland ponds and the Large Reservoirs Prescription Area), or intermittent stream, as well as the associated soils, vegetation and hydrology. It extends down into the ground water, up above the canopy, outward across the flood plain, up the near-slopes that drain into the water, laterally into the terrestrial ecosystem, and along the watercourse at a variable width (Ilhardt et al. 2000). Wetlands, springs and seeps may also be covered under the 1.G. Rare Community Prescription Area. See Figure 3 - 1 for a graphical representation of a Riparian Corridor.



**Figure 3 - 1. Simplified Representation of a Riparian Corridor.**

The width of the Riparian Corridor varies but is always measured from the edge of the channel or bank. The Corridor encompasses, at a minimum, the 100-year flood plain or the distance listed in Table 3-1, whichever is greater. Beyond this Prescription Area, Kentucky's Best Management Practices for Forestry (Stringer and Perkins, 1997) are to be followed where applicable.

**Table 3 - 1. Width of Riparian Corridor, measured from the edge of each bank.**

	Distance from each bank, in feet (if greater than the 100-year flood plain)
Perennial streams and other perennial water bodies (excluding Large Reservoir PA)	100
Intermittent streams	50

An interrupted stream (a watercourse that goes underground and then reappears) will be measured as if the stream were above ground. For braided streams, the outermost braid will be used as the water's edge. For ponds, small lakes, wetlands (including associated seeps or springs), and other water bodies, the measurement begins at the ordinary high water mark.

Estimated acreages of the Riparian Prescription allocations are based on the 100-year flood plain and the widths described in Table 3-1. Riparian corridor widths are designed to encompass the riparian area defined on the basis of soils, vegetation and hydrology (the 100 year flood plain), and the ecological functions and values associated with the riparian area. The 100-year floodplain or the widths in Table 3-1 shall be used to define the Riparian Corridor.

Riparian corridor widths are designed to encompass the riparian area defined on the basis of soils, vegetation and hydrology (the 100 year flood plain), and the ecological functions and values associated with the riparian area. The widths in Table 3-1 shall be used to define the Riparian Corridor.

This Prescription Area consists of 155,370 acres across all Management Areas. Approximately 2,757 acres are classified as Suitable for Timber Production (Scheduled Harvest) – Non-timber emphasis. The remainder of this Prescription Area is classified as Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

### Desired Future Condition

**Emphasis of Condition:** A riparian corridor is managed to retain, restore, and/or enhance the inherent ecological processes and functions of the associated aquatic, riparian, and upland components. Primarily, only natural processes (floods, erosion, seasonal fluctuations, etc.) modify the landscape and resources within the area.

**Desired Ecosystem Conditions:** The biological integrity of the aquatic community is maintained with a species composition, diversity, and functional organization similar to that of the natural habitat of the region. While native aquatic biodiversity is of main concern, exceptions can be established for desired non-native sport fish species, but not to the detriment of native species.

Suitable habitat is available for aquatic or riparian-associated species. Numerous large trees in a relatively continuous forest cover, diverse vegetation, and a variety of wildlife generally characterize the riparian forest. Wet meadows and other non-forest communities or open forest may occasionally occur where flooding, wind damage, wildland fire, restoration, and/or vegetation management activities have left signs of disturbance. Much of the older riparian forest contains multiple canopy layers, providing a variety of habitat niches and wildlife cover. Snags are abundant and are utilized by a wide variety of species. Dying and down trees, often in small patches, are not uncommon. Other old-growth conditions may exist. Non-native invasive species are not found in this area.

Water quality remains within a range that ensures survival, growth, reproduction, and migration of aquatic or riparian-associated species; and maintains the biological and chemical integrity of aquatic ecosystems. Stream sediment loads are elevated only during and immediately following heavy rainfall.



The physical integrity of aquatic systems, including stream banks, substrate, and other physical components of habitat is intact and stable. In-stream flows support habitat that is dependent upon the quantity and timing of flows for long-term sustainability. Flood plains properly function as detention/retention storage areas of floodwaters and sources of organic matter. Trees within the corridors are managed to provide sufficient amounts and sizes of woody debris to maintain habitat complexity and diversity for aquatic or riparian-associated species. Recruitment of woody debris typically occurs naturally; however, woody debris may be purposefully introduced to enhance aquatic and terrestrial habitat. Both in-stream and terrestrial woody debris are regarded as essential and generally left undisturbed. Modification of the flood plain or wetlands is infrequent but may be needed for protection of human life and property or for habitat or watershed restoration.

The riparian corridor functions as a passage way for aquatic and terrestrial organisms. Aquatic and terrestrial wildlife move along the corridor for daily travel as well as seasonal movement. The corridor also connects habitats and populations, facilitating the gene flow that supports genetically viable populations.

**Desired Facilities and Human Activities:** Management may take place to:

- a) Provide terrestrial or aquatic habitat improvement
- b) Favor recovery of native vegetation
- c) Sustain or enhance aquatic or riparian-associated species
- d) Control insect infestation and disease
- e) Comply with legal requirements
- f) Provide for public safety
- g) Support other riparian functions and values.

Vegetation management, including a limited amount of logging, may occur when the purpose is to improve riparian function and values or where cable corridors are needed for adjacent Prescription Areas.

Prescribed fire is occasionally used within the corridor to establish or maintain fire-enhanced vegetative communities (e.g., canebrakes).

Many locations in this area are accessible for public enjoyment. Hiking, hunting, fishing, and wildlife viewing are typical of activities that occur in this area. Trails may occasionally cross or follow a stream. A few maintained fishing access points are found near roads.

Developed recreation areas and facilities are maintained or upgraded to be compatible with riparian values and do not adversely impact aquatic systems. If not, they are closed and restored to natural conditions. Few new roads are constructed within the Riparian Corridor. Roads, culverts, and bridges maintain the connectivity of the aquatic community and protect the aquatic environment. Construction is short term and maintains water flow and flood plain function.

## Goals and Objectives

### **1.E-Goal 1.** Restore and maintain native aquatic biodiversity.

**1.E-Objective 1.A.** Ensure stable or improving trends of aquatic macroinvertebrate assemblages (e.g., aquatic insects, mollusks, etc.).

### **1.E-Goal 2.** Restore and maintain native species composition as well as the structural diversity of plant communities in riparian areas and wetlands. This goal seeks to provide habitat for numerous vascular and nonvascular plants, amphibians, birds, and mammals associated at least in part with riparian areas.

**1.E-Objective 2.A.** Perpetuate native riparian forest type groups such as conifer-northern hardwoods, mesophytic hardwoods, or the river flood plain hardwood and eastern river front types.

**1.E-Objective 2.B.** Maintains one to two percent of the riparian area in each 5<sup>th</sup> level watershed (all ownerships) in 0.25-1.0 acre permanent shrub-sapling openings with no canopy to provide habitat for American redstart, cerulean warbler, and additional habitat for beaver.

**1.E-Objective 2.C.** Maintains one to two percent of the riparian area in each 5<sup>th</sup> level watershed (all ownerships) in uneven-aged regeneration areas with a dense shrub-sapling component and openings no larger than one-quarter acre. These would be fixed areas no more than one-quarter mile along the stream to provide habitat for the Swainson's warbler, American redstart, and cerulean warbler.

**1.E-Objective 2.D.** In each Management Area, establish and maintain one to two percent of the riparian area along 4<sup>th</sup> order and larger streams (all ownerships) in canebrakes of up to ten acres. Existing openings will be used whenever possible. Approximately 50 percent will be in sparse overstory (<40 BA) trees. This objective seeks to restore cane to the riparian areas and provides habitat benefits for Swainson's warbler.

**1.E-Objective 2.E.** Develop and maintain at least 80 percent of existing hemlock-white pine forest type in a mature to old-growth (70+ age) condition with a thick shrub-sapling understory, without opening and roads. Louisiana waterthrush and sharp-shinned hawk are specifically targeted, the former for general habitat and the latter for breeding habitat.

**1.E-Objective 2.F.** Prevent, control, or eradicate populations of non-native invasive species.

**1.E-Objective 2.G.** Artificially created wetlands should be designed to function and appear as natural wetlands. New wetlands should benefit aquatic or riparian-associated species.

**1.E-Objective 2.H.** Maintain all butternut sites in a grassy or old-field condition absent of fescue to promote growth of individual trees and encourage reproduction.

### **1.E-Goal 3.** Maintain and restore the water quality (biological and chemical integrity) necessary to support healthy riparian, aquatic, and wetland ecosystems, and to ensure survival, growth, reproduction, and migration of aquatic or riparian-associated species.

- 1.E-Objective 3.A.** Concentrate restoration efforts in watersheds with impaired water bodies on Kentucky's Clean Water Act, Section 303(d) list or in watersheds that are a high priority for protection<sup>7</sup>.
- 1.E-Objective 3.B.** Reduce the number of impaired water bodies on Kentucky's Clean Water Act, Section 303(d), list that are located within the DBNF.
- 1.E-Goal 4.** Maintain and restore the physical integrity of aquatic ecosystems, including stream banks, substrate, shorelines, coarse woody debris, riffles, and other components of this habitat.
- 1.E-Objective 4.A.** Human activities should not cause water temperatures in cool- and cold-water streams to exceed their natural seasonal temperature ranges.
- 1.E-Goal 5.** Restore and maintain a stable sediment regime that includes the timing, volume, rate, and character of sediment input, storage, and transport.
- 1.E-Objective-5.A.** Sustain sedimentation rates that maintain or improve biological conditions. Measure rates using best available channel stability techniques.
- 1.E-Objective-5.B.** Where feasible, new roads should be located outside the Riparian Corridor. If a road is located in the Riparian Corridor, construct to protect riparian functions and values.
- 1.E-Goal 6.** Provide for unrestricted movement of aquatic fauna, except for existing approved dams.
- 1.E-Objective 6.A.** Remove or reconstruct artificial structures that impede the movement of aquatic organisms.
- 1.E-Objective 6.B.** Reduce or remove contaminants that impede the movement of aquatic organisms.
- 1.E-Objective 6.C.** Inventory within two years all artificial structures in streams with PETS species. Each year improve, rehabilitate, or remove 20 percent of structures that adversely impact passage of aquatic organisms; give priority to passageways for aquatic PETS species.
- 1.E-Goal 7.** Protect the riparian ecosystem while providing for a reasonable amount of compatible recreation.
- 1.E-Objective 7.A.** Inventory dispersed camping sites within 100 feet of perennial streams, in conjunction with annual integrated inventories. Examine 20 percent of known sites annually and designate and rehabilitate or close. Give priority to sites in proximity to aquatic PETS species.

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<sup>7</sup> USDA Forest Service 2001a, Walker 2001a

## Standards

### MINERALS

- 1.E-MIN-1.** All federal mineral activity will be implemented in accordance with the Desired Future Condition and standards of this prescription area; and, depending on site-specific determination, the Forest Service may specify that the surface is not to be disturbed during mineral exploration or development. New federal oil, and gas leases will contain either a No Surface Occupancy stipulation or a Controlled Surface Use stipulation.
- 1.E-MIN-2.** Do not remove common variety minerals, such as sand and gravel, from stream channels, except as necessary to reduce undesirable buildup at stream crossings.
- 1.E-MIN-3.** Allow non-commercial mineral collection only under terms of a special use authorization where it does not adversely affect stream channel stability, substrate, aquatic species, or their habitat.

### ROADS/ENGINEERING

- 1.E-ENG-1.** Construction of any new stream crossings must not adversely affect passage of aquatic organisms or alter stream flow. Exceptions may be allowed to prevent the upstream migration of undesired species.
- 1.E-ENG-2.** Locate fords only where bottom conditions will support the designed use. Maintain stream channel contour and grade when modifying a crossing; armor the bottom with materials that will provide for movement of fish.
- 1.E-ENG-3.** Where risks of resource damage are high, each road segment will be constructed and stabilized prior to starting another segment (stage construction). High-risk areas are those that contain landslide-prone areas, steep slopes, highly erosive soils, or PETS species.

### WILDLIFE

- 1.E-WLF-1.** Prohibit in-stream substrate disturbance by mechanical equipment from February 1 through July 31 if aquatic PETS species occur within one-quarter mile upstream and one mile downstream of the project site.
- 1.E-WLF-2.** Where existing grassy openings cause adverse impacts to riparian and aquatic associated species, they will be rehabilitated or no longer maintained as a grassy opening.
- 1.E-WLF-3.** New grassy openings will be established only where needed to provide habitat for aquatic or riparian-associated species.
- 1.E-WLF-4.** Maintain all existing openings in the riparian area corridors of the Red River, the Middle Fork of the Red River, and their larger tributaries. Maintain alternating strips or clumps of grassy/forb, old-field condition and shrubby condition to provide habitat for the only documented populations of cornsnake on the forest.

**RECREATION**

- 1.E-REC-1.** No new trails for off-highway vehicles, bicycles, horses, and other non-pedestrian modes of transportation are to be constructed within the area, except to approach and cross at designated sites, or where the trail location requires some encroachment (e.g. to accommodate steep slopes).
- 1.E-REC-2.** Do not allow overnight tethering or corralling of horses or other livestock within 100 feet of stream courses or 300 feet of other water bodies. Maintain existing corral sites to limit impacts to water quality and riparian corridors.
- 1.E-REC-3.** Any trail construction must be accomplished in accordance with relevant state Best Management Practices<sup>8</sup> or Forest Service regional/national direction for erosion control (e.g., USFS Region 8 Trails South<sup>9</sup>).
- 1.E-REC-4.** Proposed or new facilities must be developed in accordance with Executive Orders 11988 (for 100-year flood plains) and 11990 (for wetlands). Alternative locations must be considered for all new facilities. Where none exist, potential impacts must be mitigated to moderate the severity of those impacts.
- 1.E-REC-5.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experienceness of semi-primitive non-motorized, semi-primitive motorized, and roaded natural.
- 1.E-REC-6.** New non-motorized trail construction is allowed to improve existing trail configuration and improve access to streams, lakes and the riparian corridor.
- 1.E-REC-7.** Motorized and non-motorized trail reconstruction and relocation within the riparian corridor are allowed to reduce impacts to riparian and aquatic resources.

**VEGETATION**

- 1.E-VEG-1.** Cable logging corridors, cable sets, and tail trees may be installed in this Prescription Area only at designated locations. Full suspension will be required if logs are yarded across perennial or intermittent streams.
- 1.E-VEG-2.** All motorized equipment must be serviced outside of riparian corridors.
- 1.E-VEG-3.** Cut-and-leave will be the preferred method for control and suppression of insects and disease in the Riparian Corridor. Other control measures may be used when a condition poses a risk to stream stability, degrades water quality, adversely affects habitat for aquatic or riparian-associated species, poses a threat to public safety or facilities, or when the purpose or need for action will not be met.
- 1.E-VEG-4.** Skid roads and skid trails used for management of adjacent Prescription Areas must not encroach upon the riparian corridor.
- 1.E-VEG-5.** The removal of coarse woody debris (pieces greater than 3 feet long and 4 inches in diameter on the small end) is allowed only if it poses a risk to public safety or water quality,

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<sup>8</sup> Stringer and Perkins 1997

<sup>9</sup> USDA Forest Service [undated]

degrades habitat for aquatic or riparian-associated species, or when it poses a threat to private property or Forest Service infrastructures.

**1.E-VEG-6.** Collection of non-timber forest products within 50 feet of a perennial or intermittent stream is subject to the following restrictions:

- a) Personal use moss collection is prohibited.
- b) Collection of other species within this zone is limited to those species that cannot be feasibly collected elsewhere (e.g., no collection of *Rhododendron* is allowed within riparian areas because it can be collected on upland or midslope sites.)
- c) For ground disturbing activities (transplants, root digging, etc.) a maximum of 10 plants will be allowed per permit, with no more than two permits sold to an individual per year.
- d) Non-destructive activities (seed collection, cuttings, etc.) are allowed for all species unless otherwise prohibited.

## **PRESCRIBED FIRE**

**1.E-FIRE-1.** Do not construct prescribed firelines with heavy, mechanized equipment (e.g., trackhoes and bulldozers).

## 1.G. RARE COMMUNITY

### Setting

Rare communities usually occur as small (a few hundred square feet to a few acres) areas of distinguishing vegetation, often with related surface and ground water conditions, and soil and bedrock characteristics. They generally occur as small islands in the context of a larger forest community. They are disturbance sensitive, but often disturbance dependent communities of plants and animals. Most of these communities provide specific habitat for rare or uncommon plants and animals. Prior to 1700, many of these rare communities were more abundant than they are today (Owen 2002, Trani-Griep 2002). Many are likely to disappear over time without direct manipulation of vegetation.

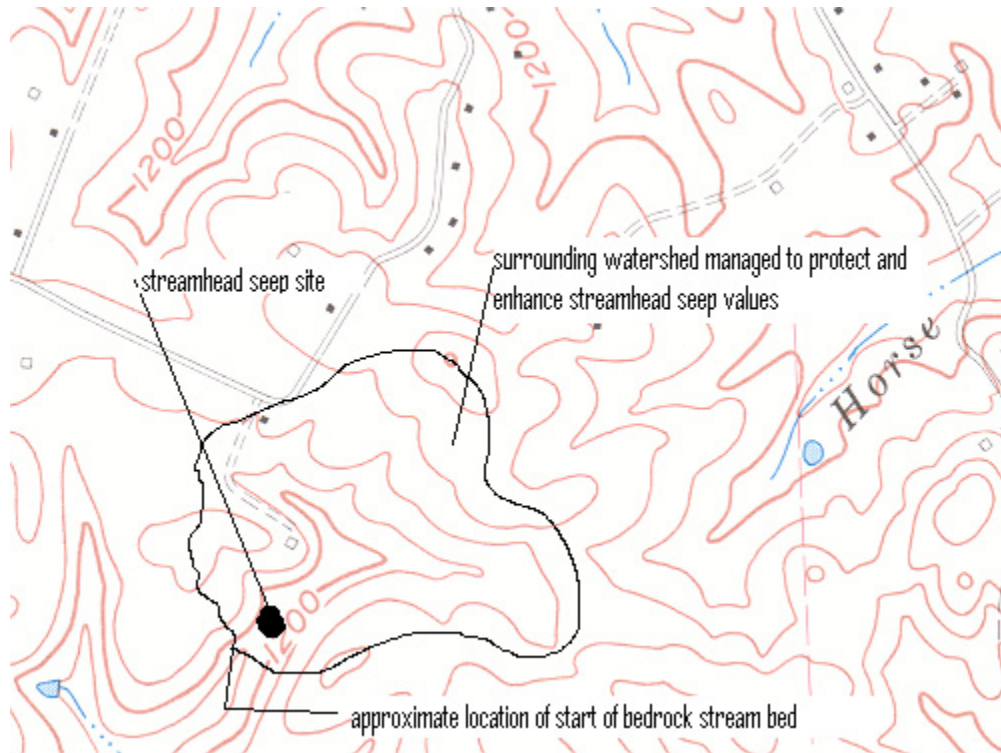
Management zones have been established around the most sensitive of these communities. In this document, the rare community itself is referred to as the “rare community site,” and the surrounding management zone is referred to as the “rare community management zone” (See Figure 3 - 2). Rare community management zones occur only around wetland communities.

**Community Descriptions:** Rare communities occur throughout the DBNF. Many specific communities have been identified on the Forest. They are described below as they currently exist. Many different systems exist for defining and identifying any community, and there is no exception for rare communities (see Owen 2002). All are influenced by surrounding abiotic and biotic conditions as well as management activities within, and adjacent to, the rare community.

**Streamhead Seeps/Bogs:** Naturally occurring (rarely induced by human action) wetlands associated with low-order streams. As the name implies, they usually occur in or near streamheads, on usually 2<sup>nd</sup> and 3<sup>rd</sup> order streams, rarely on or near 4<sup>th</sup> order streams. These are areas of boggy soils with vegetation growing in saturated pockets of sand. They are supplied water by both the stream and ground water seeps from geologic contact zones along the stream channel. Water flows perennially in these sites, although at times it is low-rate subsurface flow. Vegetation is dominated by herbaceous species with sphagnum moss species often dominant. Trees and shrubs may be present. These sites harbor many rare or uncommon species such as grass pink, white fringeless orchid and ginger-leaved grass-of-Parnassus. Numerous, possibly endemic, crayfish species inhabit these sites. They provide habitat for a variety of amphibians, birds, and small mammals (Trani-Griep 2002). These sites are sensitive to changes in water flow, especially changes in surface water flow. Roads and other soil cutting activities can severely alter their hydrology.

**Slope Seeps:** Naturally occurring wetlands associated with extensive geologic contact zones. Generally located down slope, these low-order streams drain, rather than feed, wetlands. Like streamhead seeps and bogs, these boggy areas are formed of saturated soils. Water flows perennially in these sites, although at times it is low-rate subsurface flow. Vegetation is dominated by herbaceous species with sphagnum moss species often dominant. Trees and shrubs may be present. These sites harbor many rare or uncommon species, such as the caric sedge *Carex seorsa* and the liverwort *Telaranea nematodes*. They provide habitat for a variety of amphibians, birds, and small mammals (Trani-Griep 2002). The sites are sensitive to changes in water flow, especially changes in surface water flow. Roads and other soil cutting activities can severely alter the hydrology of these sites.

**Swamps:** Naturally occurring wooded wetlands. They are characterized by standing water throughout the year (some drying may occur in drought years) and the presence of trees tolerant of flooding. They form in depression areas where clay layers prevent seepage of water out of the depressions. Water may come from flooding, stream inflow, or ground water sources. Trees dominate the vegetation, but tufts of emergent herbaceous species are common. These harbor many rare or uncommon species, such as the uptight caric sedge. Many swamps have been drained or filled-in over the last 200 years (Owen 2002).



**Figure 3 - 2. This example shows the delineation of a watershed area that forms a rare community management zone around a wetland rare community site. (Not an actual site.)**

**Natural Ponds:** Naturally occurring water bodies. On the DBNF, they occur along ridgetops, usually on those capped by sandstone. They appear as old farm ponds, but usually have trees growing in or at their edges. Frequently, the buttonbush shrub is found in these ponds. Ponds may harbor rare or uncommon species such as pond caric sedge. Several of these ponds have yielded pollen and charcoal records from bottom sediments. Unfortunately, dredging or fill altered many of these ponds in the last 200 years. Land use change on surrounding lands has also altered many natural ponds. Many of these ponds retain water throughout the year, except in drought years, but some regularly dry out.

**Limestone Glades:** Naturally occurring areas (rarely induced by human action) of thin soil on limestone cliffs or outcrops. Tree growth is absent or severely stunted, although shrubs may be present. Vegetation dominated by herbs, usually grasses and sedges, is often sparse. Most glades are dry, but they can have associated seeps. They harbor rare or uncommon species such as mountain lover and nettleleaf noseburn. They are threatened by fire exclusion, loss of large-ungulate herbivory, and activities such as quarrying (Trani-Griep 2002).



**Sandstone Glades:** Naturally occurring areas of thin soil on sandstone cliffs or outcrops. Tree growth is absent or severely stunted, although low shrubs are commonly present. Vegetation is dominated by low shrubs or herbs and may be sparse. Most glades are dry, but they can have associated seeps. They harbor rare or uncommon species such as box huckleberry and occasionally Appalachian spreading pogonia.

**Spray Cliffs:** Naturally occurring areas (rarely induced by human action) found at and adjacent to waterfalls. They are zones of high humidity, constant moisture, and cool temperatures created by waterfall spray. Portions of the cliff are often shaded, further enhancing moist, cool conditions. Spray cliff-zones harbor many rare or uncommon species such as little mountain meadow rue, sword moss, and cliff caddisfly.

**Canebrakes:** Naturally occurring grasslands or wooded grasslands dominated by a form of cane, a native bamboo. They are usually dense and once extended for tens of acres. Canebrakes are usually associated with river flood plains (river cane form), but also occur on uplands (hill cane form). Many of the canebrakes on the Forest are in poor condition; all are small. Cane itself is somewhat uncommon on the Forest. Canebrakes may once have been primary habitat (Trani-Griep 2002, Brantley and Platt 2001) for the uncommon Swainson's warbler.

**Native Warm-season Grasslands:** Naturally occurring grasslands (such areas created by human action also are present on the forest) that are dominated by warm-season grasses. Many of these areas are edaphically controlled, but most are maintained by fire. Historically, they were associated with burned yellow pine, upland oak and mixed oak-yellow pine woodlands, occurring as open areas between clusters of trees. They were likely more common in the past. In the grassland areas, trees are usually absent, although small shrubs and saplings may occur in sites of poorer condition. These areas are generally small, often less than one-quarter acre, but may occur as areas as large as 20 to 30 acres. Native warm-season grasslands provide habitat for many rare or uncommon species such as royal catchfly and yucca-leaved rattlesnake master. In conjunction with woodland, they provide habitat for uncommon species such as eastern slender glass lizard and Diana fritillary. These communities are threatened by fire exclusion, loss of large ungulate herbivory (grazing by large, hooved mammals) and land use change (see Owen 2002).

**Wet Meadows:** Native communities associated with fragipan soils or ground/surface water sources that maintain moist to wet soils through most of the year. Cool-season grasses (some warm-season grasses may be present), sedges and rushes dominate the vegetation. Various forbs are present. Woody plants are generally few, primarily small shrubs. Wet meadows are often associated with river flood plains, but may occur on broad toe slopes and ridges. They provide habitat for rare or uncommon species such as grass-pink, and if extensive enough sedge wren. These communities are threatened by draining, loss of large ungulate herbivory (grazing by large, hooved mammals), possibly fire exclusion, and control of stream flows.

**Cedar Glades:** Naturally occurring communities associated with usually dry limestone outcrops and cliffs. On the DBNF, most are along ridgetops, but at least one is on a limestone slope. The sites are rocky with thin soil. Eastern redcedar is often the dominant woody species, but past management may have reduced cedar, allowing oaks and ashes to become dominant. The canopy may be open with either a grass-forb or shrub dominated understory. Closed canopies often have sparse understories with extensive thickets of catbrier and sawbrier. The open canopy condition provides habitat for many rare or uncommon species such as mountain lover and Harris's goldenrod. Many have been altered through fire exclusion.

**Cedar Woodlands/Grasslands:** Are defined as a naturally occurring mosaic of eastern redcedar and predominantly native grass-sedge patches. The communities often appear as overgrown abandoned fields, but are dominated by native species. These communities occur on siltstone (rarely other calcareous substrates including mudstone and limestone) slopes. The sites are generally dry, and a combination of infrequent fire and edaphic conditions maintain the community. Herbivory by large ungulates may have occurred in the past. The loss or reduction of these disturbances threatens the community type. This community type is known in Bath County, but has not yet been documented on the DBNF. This community type is known to provide habitat for the rare juniper sedge. The community is included here as there is some possibility it may occur on the Forest, and there is need to recognize the community. Additionally juniper sedge occurs more frequently in an oak dominated variant of this community type at the southern edge of its range (Naczi and Ford 2001). This community variant is included here if it occurs with juniper sedge.

This Prescription Area, found in all Management Areas, is currently estimated at approximately 1,200 acres across all Management Areas.

This Prescription Area is classified as Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

### Desired Future Condition

**Emphasis of Condition:** These areas are managed to promote the habitat conditions that support the diverse and locally unique assemblage of plant and animal species occurring within them. While not devoid of human influence, natural conditions are allowed to regulate the communities when possible. Rare communities may continue to be protected as classified, or may be recommended for designation as a botanical or zoological area.

**Desired Ecosystem Conditions:** These systems are dynamic and subject to a variety of weather and other disturbances. Some, such as streamhead wetlands, appear to be somewhat mobile within a stream channel over time, so they are never truly stable. However, as habitat for numerous rare species, stability of the community within the capability of the system is desired; i.e., the desire is to sustain the communities in a condition to support the species associated with them. These areas are characterized by conditions particular to the community in question.

**Streamhead Seeps/Bogs and Slope Seeps:** Are stable within their respective watersheds. Natural ground and surface water flows and flow patterns are allowed to control the hydrology of the system with limited influence from surface features such as roads and trails. The vegetation immediately adjacent to the seep/bog provides a mosaic of heavy to light shade and open areas. The vegetation within the seep/bog is dominated by graminoids within a matrix of sphagnum mosses and other mosses and liverworts. Vegetation within the rare community area of the watershed is conducive to providing steady, seasonally variable, water flow to the system and allows lateral light to reach portions of the seep/bog. Vegetation around upland seeps/bogs is maintained in an array of basal areas from 60-100 square feet per acre, and is influenced by regularly prescribed fire, which may at times burn through all or portions of the seep/bog. Vegetation around more sheltered seeps/bogs may or may not be fire-mediated. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Swamps:** Are stable within their respective watersheds. Natural ground and surface water flows and flow patterns will be allowed to control the hydrology of the system with limited influence from surface features such as roads and trails. The vegetation immediately adjacent to the swamp provides a mosaic of heavy to light shade and open areas. The vegetation within the swamp is dominated by graminoids underneath a canopy of trees and shrubs tolerant of prolonged flooding and saturated soils. Areas of shaded and open, standing water are likely to occur. Snags likely occur in the swamp. Vegetation immediately surrounding swamps is generally wet-soil tolerant. Vegetation in the rare community area of the watershed is generally of a river flood plain or mixed mesophytic forest type. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Natural ponds:** Are hydrologically stable. Natural seasonal fluctuations in water levels are expected. In extended drought periods, natural ponds may dry completely. Species such as buttonbush and red maple may grow in ponds, or ponds may have open water. Natural ponds will be in forested settings. Surrounding yellow pine or hardwood forests may have low to high basal (60-100+ square feet per acre), but at the pond margin both open and dense vegetation areas occur. In addition dead falls are found in and at the edge of the pond. Snags may occur in and at the edge of the pond. Vegetation immediately adjacent to the pond consists of species tolerant of saturated soils and seasonal flooding. Prescribed fire may occur adjacent to natural ponds. Non-native invasive species are not found in this community and aggressive native species are controlled. No fish are found in these ponds.

**Limestone Glades:** Remain largely open, with limited woody vegetation. Pockets of low shrubs may occur. Mosses, graminoids, forbs, and rock dominate the glade. An occasional tree may occur. Most often these glades are dry, but seasonal or perennial seeps are found in many. Surrounding wooded land may have low to high basal area, 40-100+ square feet per acre. Some areas of dense vegetation occur at the transition between glade and wooded area. Low intensity, short duration fire may occur in these glades, but is infrequent, with generally no more than one fire per 10 years. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Sandstone Glades:** Remain largely open, with limited trees and tall shrubs. Lichens, graminoids, forbs, low shrubs, and rock dominate the glade. An occasional tree may occur. These glades generally are dry, but seasonal or perennial seeps are found in many. Surrounding wooded land may have low to high basal area, 40-100+ square feet per acre. Some areas of dense vegetation occur at the transition between glade and wooded area. In places, adjacent canopy trees shade the glade at least part of the day. Low intensity, short duration fire may occur in these glades, but is infrequent, generally no more than one per 10 years. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Spray Cliffs:** Are hydrologically stable, responding to the natural seasonal variation in streamflow. Cliff surfaces adjacent to the cliff remain moist and humid. They are situated in forested conditions, with the crest of the waterfall in yellow pine or oak dominated forest in upland areas, and the crest in mixed hardwood or mixed conifer-northern hardwood forest in midslope or lower slope areas. The foot of the waterfall is usually heavily shaded and high humidity and cool temperatures are maintained. The slopes within 200 feet either side of the waterfall are undisturbed except by natural events. The cliff edge within 200 feet either side of the waterfall is undisturbed except by natural events, occasional prescribed fire, and replacement

of pitch pine if it does not naturally regenerate. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Canebrakes:** Are actively growing, and stable or increasing in size. Whether under a canopy or in the open, stems are dense, generally greater than 15 per square foot. Few plant species other than cane and overstory trees are found in these areas. Both upland and river bottom canebrakes are found. Canebrakes burn approximately once every seven years. Other than flood and fire events, and management to maintain wooded sites at between 40-60 square feet of basal area, canebrakes are undisturbed. Roads and trails are not found in canebrakes. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Native Warm-season Grasslands:** Usually occur as areas of 1 to 15 acres in size, but some areas may exceed 100 acres. Native warm-season grasses and native forbs dominate the community. Few, if any, shrubs or trees occur in the areas, but open forest may occur around the community or as small, isolated pockets in extensive areas of native warm-season grasses. Numerous birds, small mammals and reptiles find habitat in these areas. Regular occurrence of fire reduces accumulated biomass and promotes flowering of grasses and forbs. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Wet Meadows:** Occur as areas of one-quarter to five or more acres in size. They are hydrologically stable, influenced primarily by seasonal variation in precipitation. The water table remains at or just below the surface. Hydrological influences from trails and roads are minimal. Native graminoid and native forb species dominate the vegetation. Small clusters of shrubs or trees may occur. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Cedar Glades:** Occur as mosaics of open eastern redcedar (40-60 square feet basal area) and open, generally rocky areas. Other trees such as chinquapin oak and blue ash may be present, but eastern redcedar is dominant. In open areas, low shrubs or grass-sedge-forb species dominate the vegetation. Infrequent, low-intensity fires with short residence-time occur at greater than 10-year intervals. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Cedar Woodlands/Grasslands:** Remain stable; eastern redcedar is the dominant woody species (with the exception indicated in the Setting). Open grass-sedge areas are herbaceous with little or no woody vegetation; forbs are secondary to grasses and sedges. Fire is expected in these areas, probably on a greater than 10-year return interval. Non-native invasive species are not found in this community and aggressive native species are controlled.

**Desired Facilities and Human Activities:** Roads, trails, or other facilities may be found within some rare community areas, but these are not encouraged. Dispersed recreational uses occur but are not encouraged. Management activities may occur as needed to restore, maintain, or enhance these communities, including, but not limited to, maintenance and construction of roads, trails, ponds, openings, prescribed burning, and removal of any natural materials, including through salvage cut.

## Goals and Objectives

**1.G-Goal 1.** Maintain rare communities in a condition capable of sustaining the species associated with them.

**1.G-Objective 1.A.** Bring all National Forest System roads in or within 100 feet of a rare community site or management zone, and which are required for administrative or public access, to a design standard compatible with the associated rare community to prevent diminution of the community's function. Close or obliterate unneeded roads.

**1.G-Objective 1.B.** Eliminate non-native invasive species from the areas as soon as possible. Prevent the establishment of populations of non-native invasive species. Control invasive native species if they threaten the integrity of the rare community.

**1.G-Objective 1.C.** Use available tools, such as prescribed fire, to maintain the community in a reasonably stable condition. Apply management as frequently as necessary to prevent major changes in vegetation. Base the timing of management on a rare community's specific characteristics. Take action as soon as sufficient changes in the community are discovered.

**1.G-Objective-1.D.** Discourage camping in rare community sites.

**1.G-Objective-1.E.** Maintain and perpetuate all streamhead and slope seeps and swamps that provide habitat for Conservation species.

**1.G-Objective-1.F.** Restore or re-establish rare communities where impacts have not fully destroyed the character and function of the community.

**1.G-Objective-1.G.** Where it is has been degraded, rehabilitate canebrake habitat.

**1.G-Objective 1.H.** Maintain native warm-season grasslands with periodic prescribed burning.

**1.G-Objective 1.I.** Maintain a high diversity of native graminoids and forbs in native warm-season grasslands.

**1.G-Objective 1.J.** Maintain a stable hydrologic regime in wet meadows within natural variation.

**1.G-Objective 1.K.** Maintain a stable hydrologic regime at spray cliffs within natural variation.

**1.G-Objective 1.L.** Maintain a stable hydrologic regime natural ponds within natural variation.

**1.G-Objective 1.M.** Maintain limestone and sandstone glades with sparse tree cover and a mosaic of rock surface and vegetation.

**1.G-Objective 1.N.** Maintain redcedar as the dominant tree species in cedar glades.

**1.G-Objective 1.O.** Maintain a mosaic of redcedar and graminoid vegetation in cedar woodlands/grasslands.

**1.G-Goal 2.** Map and catalog all occurrences of each recognized rare community.

**1.G-Objective 2.A.** Conduct an inventory of each rare community occurrence as part of an integrated inventory.

### Standards for Rare Communities

Unless otherwise indicated by the codes below, Standards apply to all Rare Community Prescription Areas:

**Standards for streamhead bogs or seeps, slope seeps, and swamps, if they provide habitat for Conservation species (WET):** Many of these areas occur within the Riparian Corridor Prescription Area. Refer to this prescription for direction as well.

**Standards for Canebrakes (CANE):** These are usually found in riparian areas. Refer to the Riparian Corridor Prescription Area as well.

**Standards for Glades (GLADE):** These areas are usually associated with cliffs, but are not limited to them. Refer to the Cliffline Community Prescription Area as well.

**Standards for native warm season grassland (GRASS):** These areas may be associated with glades, bottomlands, forest, and other areas. Direction for other habitat associations' Prescription Areas should be considered.

### MINERALS

**1.G-MIN-1.** Within Rare Community Sites: the surface is not to be disturbed during any federal mineral exploration or development activity; development of federally owned oil and gas is subject to the no surface occupancy stipulation.

**1.G-MIN-2.** Within Rare Community Management Zones: development of federally owned oil and gas is subject to the controlled surface use stipulation; all other federal mineral activity will be implemented in accordance with the Desired Future Condition and standards of this prescription area.

### ROADS/ENGINEERING

**1.G-ENG-WET-1.** Subject to valid existing rights, do not permit new roads in the watershed above and adjacent to a rare community site (Table 3 - 2). Do not concentrate surface water runoff from roads, ruts, trails, and landings into streams within the defined watershed but rather disperse it across a wide area.

**1.G-ENG-WET-2.** Do not permit management activities in seep/streamhead/swamp rare communities (Figure 3 - 2) that are likely to decrease, primarily through changes in hydrologic balance, the likelihood of maintaining the viability of species that have uncertain prospects for continued viability. Hydrologic changes include those caused by changes in canopy vegetation.

**1.G-ENG-CANE-1.** Do not place impoundments where they can flood or alter canebrakes.

**RECREATION**

- 1.G-REC-1.** Allow no off-highway vehicle use in the Rare Community site.
- 1.G-REC-2.** Build no new trails in Rare Community sites.
- 1.G-REC-3.** Do not concentrate public use in Rare Community sites.
- 1.G-REC-4.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non motorized, semi-primitive motorized, and roaded natural.

**VEGETATION**

- 1.G-VEG-1.** Collection of non-timber forest products is not allowed, except for scientific purposes.
- 1.G-VEG-WET-1.** Do not manage the overstory canopy basal area (BA) for less than 60 square feet/acre (existing areas of lower BA may be kept at the lower BA; existing road and utility rights-of-way exempted) in the small watershed above and adjacent to and containing seeps, streamhead bogs, and swamps (Figure 3 - 2). The midstory layer BA may be reduced or removed.
- 1.G-VEG-WET-2.** Do not manage the overstory canopy basal area for less than 60 square feet per acre in the small watershed below and containing seeps, streamhead bogs, or swamps before the stream flows on extensive bedrock (Figure 3 - 2). Areas of existing lower basal area may be managed at the lower basal area. Once the streambed is on extensive bedrock, or below an incised bedrock cataract, head cutting and down cutting concerns are minimized and this standard does not apply.
- 1.G-VEG-CANE-1.** Do not alter canebrakes, except to benefit the canebrake, or as needed for management of PETS species or habitat for Conservation species.

**PRESCRIBED FIRE**

- 1.G-FIRE-1.** Use prescribed fire only when not detrimental to the rare community.
- 1.G-FIRE-2.** Do not use heavy equipment in rare community sites for prescribed burning.
- 1.G-FIRE-WET-1.** Do not build firelines for prescribed burns through streamhead seeps/bogs, swamps, or other natural wetland rare community management zones, if they are likely to change the hydrologic balance.
- 1-G-FIRE-GLADE-1.** Do not directly ignite glades during prescribed burning unless vegetation is primarily graminoid. Allow fire to move into the glade from other ignited areas.

## 1.I. DESIGNATED OLD-GROWTH

### Setting

Designated Old-Growth refers only to this Prescription Area, and encompasses areas that will be managed specifically to promote, enhance, and maintain the old-growth community. Examination of Future Old-Growth on the forest determined that the dry-mesic oak and mixed mesophytic hardwood (including American beech) were under-represented, with less than 8 percent by old-growth type (Forestwide Objective 1.4.B.). Areas (9) identified for designation contain a high representation of these types, oldest in age structure, and that would add to the network distribution across the forest.

Old-growth stands may exist outside this Prescription Area. Old-growth does not imply first-growth forest, nor does it imply wilderness.

Currently, this Prescription Area consists of nine distinct units ranging from 325 acres to 2,552 acres, averaging 1,703 acres. If any units are to be added in the future, they generally should be at least 300 acres in size for distributional purposes, although stands as small as 10 acres could be included to provide representation for uncommon community types, or for social and cultural benefits.

This Prescription Area contains approximately 15,300 acres across all Management Areas, and is classified as Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

### Desired Future Condition

**Emphasis of Condition:** Old-age trees are encouraged to develop; related structural attributes exist. Old-growth stands are those in the later stages of structural development and typically differ from earlier stages in a variety of characteristics which may include tree size, accumulation of large wood material, number of canopy layers, species composition, and ecosystem function. Different forest communities reach old-growth conditions at different ages, under different disturbance regimes and as a result of differing management strategies. These areas contribute to an old-growth network across the Forest. Both natural processes and anthropogenic fire regimes work to maintain the old-growth types.

**Desired Ecosystem Conditions:** These areas are characterized by mostly old forest. Trees within old-growth communities range from 100-350 years in age<sup>10</sup>, based in large part on the characteristics of individual trees and site conditions. Individual trees may be older. Numerous large, old trees along with mid-size trees, a scattering of snags and senescent trees of all sizes, as well as rotting deadfalls, are present throughout. Conditions in these old-growth areas reflect the combined characteristics of each habitat association and landscape position.

In mixed mesophytic, white pine-hemlock and conifer-northern hardwood habitat associations, older, tall, large-diameter trees may predominate, but old-growth areas remain uneven-aged forest. Tree stem density is generally high, but variation is to be expected. A closed canopy is common, but

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<sup>10</sup> Average age of dominant and codominant trees. Some species such as hemlock, buckeye, and beech may live longer.



tree fall or death frequently creates gaps that become patches of dense, shrubby growth. Fires occur infrequently.

Upland associations such as oak, yellow pine and mixed oak-yellow pine communities may maintain some even-aged characteristics, but with time they can become uneven-aged. These old-growth associations typically include scatterings of large-diameter, tall trees along with more numerous smaller trees. Tree stem density is generally low to moderate. The canopy is open to nearly closed. Tree fall or death may create small to large gaps that become patches of dense, shrubby growth or prairie-like grassland. Fires frequently occur in these areas. Uneven-aged forest canopies typically are irregular, broken by gaps from natural causes.

**Desired Facilities and Human Activities:** Developed facilities are not common, but existing trails and other developed recreation sites may remain in place. Dispersed recreation occurs, with generally limited evidence of visitor activities. Depending on the community type and landscape position, evidence of human activity may be limited or extensive, providing a variety of habitat conditions (Forestry Report R8-FR-62, pgs 23 and 25). Prescribed burning and tree cutting and/or removal promote upland old-growth characteristics.

## Goals & Objectives

**1.I-Goal 1.** Move the area toward a diversity of old-growth community types.

**1.I-Objective 1.A.** Restore yellow pine-oak and oak-yellow pine forest on appropriate sites.

**1.I-Objective 1.B.** Use prescribed burning to help perpetuate fire-mediated communities.

**1.I-Objective 1.C.** Reduce the number of trees in stands on xeric to dry sites to achieve a BA of between 60 and 90 square feet per acre.

**1.I-Goal 2.** The landscape character goal is “natural appearing.”

**1.I-Objective 2.A.** Scenic integrity objectives range from “high” to “medium” with occasional small areas of “low” where vegetation management is necessary.

**1.I-Objective 2.B.** Existing roads under Forest Service jurisdiction should be closed and obliterated, where feasible, except for reasons of safety and administrative efficiency. When possible, remaining roads in Forest Service jurisdiction should be gated and maintained at minimum design levels.

**1.I-Objective 2.C.** Close or rehabilitate areas showing high resource damage.

**1.I-Objective 2.D.** When conducting salvage operations, reserve 300-acre blocks, which can include areas of up to 90 acres of damaged or downed trees.

**1.I-Objective 2.E.** Use silviculture and/or pest management where needed to meet legal or safety requirements, or maintain or promote old-growth characteristics.

## Standards

### MINERALS

**1.I-MIN-1.** Federal minerals are available under the controlled-surface-use stipulation for this Prescription Area (CSU 1.G), but mineral development facilities will be limited to one percent of each individual old-growth area.

### WILDLIFE

**1.I-WLF-1.** Wildlife openings may not be created in this area.

### VEGETATION

**1.I-VEG-1.** Collection of non-timber forest products is not allowed, except for scientific purposes.

**1.I-VEG-2.** Only native species or annual cereal grains will be used when revegetating disturbed areas.

**1.I-VEG-3.** Permit salvage or sanitation activities only when damage to a stand within an old-growth unit is greater than 30 percent of the original stand basal area *and* the total extent of damage exceeds 40 percent of the old-growth unit's area. As defined for this Prescription Area, a stand has damage when trees are dead or likely to be dead within 10 years.

**1.I-VEG-4.** During salvage or sanitation activities, reserve all 300-acre minimum size (the larger, the better) groups of stands using the following criteria:

- 1) Include as many intact stands as possible
- 2) May include up to 30 percent damage throughout
- 3) May include up to 30 percent (90 acres in 300) of the areas with stands over 40 percent damage.

### WILDLAND FIRE

**1.I-FIRE-1.** Stabilize all wildland fire control lines as soon as possible after their use. If the firelines are revegetated, use native species when available.

## 1.J. SIGNIFICANT BAT CAVES

### Setting

The Significant Bat Caves Prescription Area includes significant bat caves and a ¼-mile radius around each opening. A significant bat caves contains a minimum of 50 Indiana bats (hibernacula) or 5 Virginia or Rafinesque's big-eared bats (maternity site or hibernacula). Such sites are found in a naturally occurring cavity or system of interconnected passages, or a tunnel or mine, located beneath the surface or within a cliff, ledge, or rockshelter. These sites occur in both limestone and sandstone.

This Prescription Area, found across all Management Areas, consists of approximately 6,100 acres.

This Prescription Area is classified as Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

### Desired Future Condition

**Emphasis of Condition:** This Prescription Area is managed to restore or maintain the integrity of significant bat caves, cave openings, and associated underground physical, geological, hydrological, and biological features. These areas remain relatively undisturbed by management activities, except for those designed to protect or maintain PETS species or habitat for Conservation species.

Microclimate conditions, primarily temperature and humidity associated with these landscape features, persist. In addition, protection is provided for heritage resources, which are often associated with these features.

**Desired Ecosystem Conditions:** Overstory trees within this Prescription Area are generally old and usually replaced by natural processes. The forest community within the area varies greatly because caves and rockshelters may occur anywhere on the Forest, ranging from low elevation streamside areas and higher elevation ridgetops. Depending on location, trees may be widely scattered to heavily stocked. Prescribed fire is allowed in this area and trees may show occasional scorch marks. Non-native, invasive species do not occur.

Spelothems, speleogens, and other unique cave formations continue to develop or erode under natural conditions. Water flowing into the cave system contains normally fluctuating background levels of sediment, organic matter, and dissolved minerals and is not polluted.

**Desired Facilities and Human Activities:** This Prescription Area is protected from human activities and surface disturbance that would cause impacts to cave ecosystems or heritage resources.

Protection may include signing, gating, or other physical barriers for caves and rockshelters designated as significant bat caves. Dispersed recreation may occur within the ¼-mile zone, however, selected caves are closed to public entry or have seasonal restrictions. Prescribed fire may occur within the area.

Occasionally, management activities include the use of motorized equipment to construct or maintain roads and trails. Vegetation may be occasionally manipulated to maintain the desired ecosystem condition. Trees damaged or knocked down following unforeseen events such as wildland fire, wind, snow, and insect and disease outbreaks might be removed for public safety or to facilitate restoration consistent with the desired ecosystem condition. Tree felling and removal using

motorized equipment could occur. Fire suppression activities could include the use of heavy equipment to construct firelines, while aircraft may provide detection and suppression support.

## Goals and Objectives

**1.J-Goal 1.** Protect or enhance caves designated as significant for PETS bat species.

**1.J-Objective 1.A.** Acquire from willing sellers private lands that contain or are adjacent to caves or significant sites known to be hibernacula or maternity sites for PETS bats species.

**1.J-Objective 1.B.** Generally avoid prescribed burning within five miles of significant Indiana bat hibernacula between September 1 and December 1.

**1.J-Objective 1.C.** Manage all fires to minimize smoke impact to cave and karst areas and associated species.

## Standards

### MINERALS

**1.J-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity; development of federally owned oil and gas is subject to the no surface occupancy stipulation.

### RECREATION

**1.J-REC-1.** Restrict entry to significant colony sites for PETS bat species, where needed, with signs or gates.

**1.J-REC-2.** Prohibit camping and fire building within 200 feet of an opening to posted colony sites for PETS bat species.

### VEGETATION

**1.J-VEG-1.** Leave existing forest cover undisturbed by management activities unless the activity is designed to improve habitat for PETS and Conservation species.

**1.J-VEG-2.** Do not permit tree-cutting activities between September 1 and December 1 within five miles of known significant Indiana bat hibernacula.

**1.J-VEG-3.** Currently suitable roost trees that are 6 inches dbh or greater may be removed without checking for bats only from November 16 through March 15.

## 1.K. HABITAT DIVERSITY EMPHASIS

### Setting

This matrix of diverse habitat unites the Forest landscape. Unless allocated to another Prescription Area, National Forest System land is allocated to the Habitat Diversity Emphasis Prescription Area. It may consist of small to large parcels that may be adjacent to, or possibly surrounded by, other Prescription Areas.

This Prescription Area is currently estimated at approximately 375,900 acres across the DBNF.

Most forest and woodland in this Prescription Area is classified as Suitable for Timber Production (Scheduled Harvest) – Non-timber emphasis (approximately 341,900 acres, non-overlapping). All wooded grassland/shrubland is classified as Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions. (approximately 18,400 acres).

### Desired Future Condition

**Emphasis of Condition:** This area is managed for the purpose of maintaining biodiversity. Various management techniques are utilized to maintain this area in a variety of habitat conditions, not necessarily supported or found in other Prescription Areas. Planned management considers the type and amounts of habitat conditions created by unplanned disturbance regimes such as wildland fire, severe weather events, and insect or disease epidemics.

**Desired Ecosystem Conditions:** This Prescription Area consists of a mixture of habitat conditions that provide a desired diversity of communities. The desired diversity includes major plant communities such as mixed mesophytic, upland oak and yellow pine forests, which include American chestnut and non-forest areas such as permanent shrub or grass openings. Diversity of habitats also includes variation in the density and kind of trees within a stand, the kinds and amounts of herbaceous and shrubby plants found under the forest overstory, and the vertical structure within a stand.

Temporary forest openings are created by the removal and/or death of single trees, groups of trees (up to ¼ acre), and/or stands of trees (up to 40 acres). Occasional uncontrolled events such as weather, wildland fire, insects, or disease may result in large areas returning to young age forest habitat. Some permanent openings in grassy, forb or brush condition also are maintained in this Prescription Area. Many of these include some type of pond.

Forest conditions may range from open forest with a sparse overstory of large broad-crowned trees, to closed forest, to dense thickets of young regeneration. A large percentage of the area contains forest with well-developed vertical structure. In these areas, midstory and shrub/saplings layers would be well developed. Oak and other hardwood regeneration is present across the Prescription Area. Yellow pine regeneration, primarily shortleaf and pitch pine, emphasized on the southern portions of the Prescription Area, is also present across the forest. Most terrestrial Management Indicator Species (MIS) are well represented in this area. Invasive non-native species are not present.

Habitats in this area are managed to produce a mosaic of habitat associations. Specific habitat conditions within habitat associations are also managed as a mosaic. Areas of specific habitat conditions may occur as parcels of less than one-quarter acre up to 100 or more acres. In many cases, habitat conditions grade from one to another without clean, sharp edges. In other cases, distinct delineations are likely to occur.

Distinct blocks of this area are managed as fire-adapted communities. Within this category of fire-adapted communities, we recognize those that are fire-influenced and those that are fire-mediated communities. Fire-influenced communities are adapted to limit the frequency and intensity of fires due the nature of vegetation and physical position on the landscape among other factors, but fire still occurs within them. Fire seldom if ever drives compositional and structural change in fire-influenced communities. Fire-mediated communities are adapted to promote fire, but within community specific limits controlled in part by the nature of the vegetation within these communities and the physical position on the landscape they occupy. Fire drives both compositional and structure conditions within the community.

Within these fire-adapted blocks, fire is a dominant tool used to maintain and restore specific structural and compositional habitat conditions. These blocks include both target (i.e., fire-mediated) and non-target (i.e., fire-influenced) habitat associations where fire is desired in the former, and is not necessarily desired but accepted in the latter. It is within these fire emphasis blocks that open, low basal area (BA) oak or southern yellow pine forest with grassy or shrubby ground layers; warm season grasslands; southern yellow pine forests, and many of the moderate basal area oak forests are to be found. These are the target communities. Fire-influenced, high basal area hardwood forests, including mixed mesophytic and northern conifer-hardwood are also found here.

The following is a description of the major communities and desired habitat components that make up the Habitat Diversity Prescription Area. A more detailed breakdown of long-term objectives by Management Area can be found in Appendix C.

### Community Descriptions:

**Dense Cove Forest**<sup>11</sup> - High canopy, moderate to high basal area (70-120 or more square feet/acre) forest, some with and some without, well developed vertical structure (includes grass/forb, shrub/sapling, midstory, sub-canopy, and canopy layers): This habitat condition consists of mid to old age (70-300 years) canopy trees with various components of sub-canopy, midstory and shrub layers. This condition will be found primarily in forest types found on east and north lower and mid slopes, or in heavily shaded hollows on any aspect. Although most of this condition will occur associated with mixed mesophytic forest, some will occur with riparian forest and some will transition into dry-mesic upland hardwoods. Approximately 112,800 acres of this existing forest condition is provided.

**Mid-density Upland Forest**<sup>12</sup> - High canopy, moderate basal area (60-70 square feet/acre) forest, some with and some without, well developed midstory and shrub layers (layers evident and easy to find): This habitat condition consists of mid to old age (50-160 yrs upland, 70-240 yrs cove, lower slope) canopy trees with a dense layer of 4-15 feet shrubs/saplings. While

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<sup>11</sup> This is “forest” as defined in The Nature Conservancy’s National Vegetation Classification (Grossman et al. 1998): trees with their crowns overlapping (generally forming 60-100% cover).

<sup>12</sup> As defined in the National Vegetation Classification (Grossman et al. 1998).

dominant on upland sites in the oak, yellow pine and mixed forest types, these conditions can occur in most forest types and in most landscape positions. At least 18,800 acres of this forest condition is provided. Depending on forest health needs, more of this condition may occur (see Forestwide Goal 2.1).

**Woodland**<sup>13</sup> - High canopy, low-moderate basal area (30-50 square feet/acre) forest with a well developed shrub/grass/forb layer consisting of any or all of the mentioned vegetation forms: This habitat condition consists of mid to old age (50-200 years) canopy trees with thin to dense low shrubs ( $\leq 3$  ft) and or grasses/forbs which are promoted by a regular cycle of burning. A low density ( $\leq 5$  BA) of midstory trees may be present. This set of conditions will be found on upland sites, in hardwood (primarily oak), yellow pine and mixed forest types. It may occur in other forest types and on other landscape positions. Approximately 37,800-50,400 acres of oak-dominated woodland is provided within 30 years. Approximately 12,600-16,800 acres of yellow pine-dominated woodland is provided within 100 years.

**Wooded Grassland/Shrubland**<sup>14</sup> - High canopy, low basal area (10-29 square feet/acre) forest with a well developed shrub/grass/forb layer: This habitat condition consists of mid to old age (50-160 yrs) canopy trees with thin to dense low shrubs ( $\leq 3$  ft) or grasses/forbs which are promoted by a regular cycle of burning. A low density (5-10 BA) of midstory trees may be present. Approximately 8,700-13,650 acres of oak-dominated wooded grassland/shrubland is developed, within 50 years. Approximately 6,300-8,400 acres of yellow pine-dominated wooded grassland/shrubland is provided within 100 years.

**Two-aged or Even-aged Young Forest** - Open, low basal area (10-20 square feet/acre) or no canopy, dense seedling/sapling forest: This habitat condition consists of a limited canopy layer of generally mid age trees with dense seedlings and saplings of trees and shrubs. This will primarily occur where forests are regenerated using two-aged or even-aged silviculture. The condition may occur in any forest type on any landscape position but will generally occur in upland oak, yellow pine or mixed oak and yellow pine forest types. Approximately 18,800 acres is available the first decade and provided each following decade in shifting locations.

**Non-forest Vegetation** - Open, no-canopy, non-forest areas are maintained in warm or cool season grass, old-field or shrubland condition: This habitat condition is non-forest. In most cases, this condition is permanently maintained on specific sites. It may occur associated with any forest type and in any landscape position, but most are expected to be associated with upland positions and forests. Warm season grasslands are primarily found in association with upland oak, yellow pine and mixed forest types. Approximately 1,600 acres of existing openings are maintained.

**Ponds** - Ponds occur in two primary forms. One is the typical, permanent waterhole, which may range from a few feet to several yards deep and occupy several hundred square feet to a few acres. The other is the ephemeral pond, which is typically shallow ( $< 2$  ft. deep), and seldom occupies over a few thousand square feet. Ponds of either type may occur in any or all of the

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<sup>13</sup> Interpreted from the National Vegetation Classification (Grossman et al. 1998) definition of 25-60% canopy cover, at higher canopy cover end; the Forest Inventory and Analysis (FIA, see Hansen et al. 1992) definition of low productivity site is not being used here.

<sup>14</sup> These areas, which have  $> 25\%$  canopy cover, fall either into grassland or shrubland in the National Vegetation Classification (Grossman et al.). If grasses are dominant, it is grassland; if shrubs are dominant, it is a shrubland. These areas more or less fit FIA's definition of 'natural rangeland.' *This condition has been called 'savanna', but the term is not used here to avoid confusion with the dry savannas of Africa or the coastal pine flats of the Southeastern U.S.*

above vegetation types, but are most common on upland sites. The distribution of ponds is based on ecological capability and site-specific habitat needs. Direction for location of ponds is found under Forestwide Goal 1.2.

### **Habitat Components:**

**Open Midstory** – A portion of all forest communities within this prescription, do not have midstories. Approximately 36,000 acres of this forest condition is provided.

**Hemlock-White Pine Forest** – A portion of the forest communities within this Prescription Area consist of stands containing at least 70 percent softwood, of which the plurality of stocking is hemlock or eastern white pine. Approximately 2,900-3,100 acres of this forest type in various forest conditions is provided.

**Conifer Northern Hardwood Forest** – A portion of the forest communities within this Prescription Area consist of stands containing 50-70 percent softwood, of which the plurality of stocking is hemlock or eastern white pine. Approximately 2,600-2,800 acres of this forest type in various forest conditions is provided.

**Mixed Mesophytic Forest** – A portion of the forest communities within this Prescription Area consist of stands containing at least 70 percent mesic hardwoods, of which the plurality is not oak. Approximately 81,000 – 84,000 acres of this forest type in various forest conditions is provided.

**Beech Forest** – A portion of the forest communities within this Prescription Area consist of stands containing at least 70 percent hardwood, of which the plurality stocking is American beech. Approximately 2,600-2,800 acres of this forest type in various forest conditions is provided.

**Dry-Mesic Oak Forest** – A portion of the forest communities within this Prescription Area consist of stands containing at least 70 percent hardwood, of which the plurality stocking is oak on dry to mesic sites. Approximately 120,000-160,000 acres of this forest type in various forest conditions is provided.

**Dry-Xeric Oak Forest** – A portion of the forest communities within this Prescription Area consist of stands containing at least 70 percent hardwood, of which the plurality stocking is oak on dry to xeric sites. Approximately 18,000-22,000 acres of this forest type in various forest conditions is provided.

**Yellow-Pine Dominated Forest** – A portion of the forest communities within this Prescription Area consist of stands containing at least 50 percent softwood, of which the plurality stocking is southern yellow pine (predominantly shortleaf and pitch pine). Approximately 17,100-22,800 acres of this forest type in various forest conditions is restored within 80 years.

**Woodland** – A portion of the community types within this Prescription Area consist of stands dominated by yellow-pine or upland oaks in various combinations and pluralities, but in a woodland condition. Approximately 46,000 – 56,650 acres are provided in these forest types and condition within 120 years.

**Wooded grassland/shrubland** - A portion of the community types within this Prescription Area consist of stands dominated by yellow-pine or upland oaks in various combinations and pluralities, but in a wooded grassland/shrubland condition. Approximately 16,700 – 20,500 acres are provided in these forest types and condition within 120 years.



**Desired Facilities and Human Activities:** A well-designed and maintained road system provides access for resource protection and management. Interpretive signs are maintained in a number of areas easily reached by visitors to explain past and current activities and events. Well-maintained trails are present that are compatible with habitat conditions. Hunting occurs seasonally. When weather and burning conditions are within prescription, crews routinely burn forest, woodland, and grasslands. Other silvicultural and habitat treatments such as cutting of trees and mowing of openings routinely occurs. Temporary roads and logging decks are built for the removal of forest products. Site preparation for artificial and natural regeneration often includes the use of chainsaws, herbicide, and/or heavy equipment<sup>15</sup>.

## Goals and Objectives

**1.K-Goal 1.** Maintain a variety of habitat conditions in the area based on both composition and structure.

**1.K-Objective 1.A.** Maintain 5 to 6 percent within each 5<sup>th</sup> level watershed in the 0-10 age class, including the effects of catastrophic events. Site-specific stand conditions will determine timing of harvest. Rotations are expected to normally range between 140 and 190 years. Stands with a predominance of trees that have a shorter life expectancy or are in poor condition should have shorter rotations. Stands with a predominance of trees that have a longer life expectancy and are in good condition should have longer rotations.

**1.K-Objective 1.B.** Maintain approximately 0.4 percent of each Management Area (1,600 acres total within this Prescription Area) in grassy or old-field openings, generally greater than one-quarter acre, of which about half are warm-season grass dominated.

**1.K-Objective 1.C.** Maintain thirty percent within each 5<sup>th</sup> level watershed in a relatively closed canopy forest at least 70 years old with midstory and shrub/sapling layers. One-fourth of the 30 percent should be maintained in blocks<sup>16</sup> of at least 620 acres for interior habitat. Each block can include up to 200 acres from adjacent cliff and riparian areas; up to one-third of each block may be thinned to 60 basal areas.

**1.K-Objective 1.D.** Maintain five percent within each 5<sup>th</sup> level watershed in stands thinned to 60-70 basal areas.

**1.K-Objective 1.E.** Maintain 10 percent within each 5<sup>th</sup> level watershed in relatively closed-canopy forest at least 60 years old with dense shrub/sapling layer and little to no midstory.

**1.K-Objective 1.F.** Manage for 2,900-3,100 acres of hemlock-white pine forest within the Prescription Area, primarily in cove and lower slope positions.

**1.K-Objective 1.G.** Restore upland white pine plantations to hardwood, yellow pine, or mixed forest types where needed to meet other objectives.

<sup>15</sup>A more detailed description of vegetation management methods and techniques is found in Appendix H.

<sup>16</sup>Service level A and B roads and roads having width exceeding 50', will break up a "block". Up to 5% of the block can be in 0-10 age class or other openings.

**1.K-Objective 1.H.** Manage for 2,600-2,800 acres of conifer-northern hardwood forest within the Prescription Area.

**1.K-Objective 1.I.** Manage for 84,000-87,000 acres of mixed mesophytic forest, including beech-dominated forest, within the Prescription Area.

**1.K-Objective 1.J.** Manage for 2,600 to 2,800 acres of beech-dominated, mixed-mesophytic variant forest within the Prescription Area.

**1.K-Objective 1.K.** Manage for 120,000-160,000 acres of dry-mesic oak forest within the Prescription Area. (Goal 2 includes these acres.)

**1.K-Objective 1.L.** Manage for 18,000-22,000 acres of dry-xeric oak forest within in the Prescription Area. (Goal 2 includes these acres.)

**1.K-Objective 1.M.** Provide a minimum of two pieces of downed wood per acre, at least 12 inches in diameter and 10 feet long, across the Prescription Area. Diameter is measured at the midpoint of the largest 10-foot section.

**1.K.-Objective 1.N.** During the creation and maintenance of woodlands in which overstory cutting occurs, create, or retain when available, a minimum of one snag per acre of at least 16 inch dbh (larger where possible).

**1.K-Goal 2.** Develop and maintain 120,000 to 160,000 acres of yellow pine and oak forest, woodland, and wooded grassland/shrubland in various mixtures of species and habitat within a fire-mediated system.

**1.K-Objective 2.A.** Manage distinct blocks, ranging from 500-25,000 acres in size as fire-influenced<sup>17</sup> or fire-mediated<sup>18</sup> communities.

**1.K-Objective 2.B.** Establish and maintain 85 to 115 acres of yellow pine and yellow pine-hardwood wooded grassland/shrubland in the Cumberland River Management Area during the first decade.

**Pine/Grassland/Shrubland (acres)**

<b>Management Area</b>	<b>Decade 1</b>
<b>Licking River</b>	0
<b>Middle Kentucky River</b>	0
<b>Upper Kentucky River</b>	0
<b>Cumberland River</b>	85-115
<b>Total</b>	85-115

<sup>17</sup> Fire-influenced here means a community in which fire occurs, but at low intensity and or frequency, and when this fire affects vegetation, the effects are generally expected to be small, and not an important contributor to community composition and structure. These are non-target communities.

<sup>18</sup> Fire-mediated here means a community in which fire occurs and in which fire is expected to drive community composition and structure. These are target communities.

**1.K-Objective 2.C.** Establish and develop 430 to 570 acres of yellow pine and yellow pine-hardwood woodland in the Cumberland River Management Area in the first decade.

**Pine Woodland (acres)**

Management Area	Decade 1
Licking River	0
Middle Kentucky River	0
Upper Kentucky River	0
Cumberland River	90-110
<b>Total</b>	<b>90-110</b>

**1.K-Objective 2.D.** Establish<sup>19</sup> 7,030 to 9,370 acres of yellow pine and yellow pine-hardwood on sites decimated by the southern pine beetle epidemic of 1999-2000, during the planning period for forest, woodland, and wooded grassland/shrubland within Management Areas based on the following:

**Pine Restoration/Maintenance (acres)**

Management Area	Decade 1
Licking River	685-915
Middle Kentucky River	1,030-1,370
Upper Kentucky River	345-455
Cumberland River	4,970-6,630
<b>Total</b>	<b>7,030-9,370</b>

**1.K-Objective 2.E.** Establish and maintain 600 to 730 acres of hardwood and hardwood-yellow pine wooded grassland/shrubland in the 1<sup>st</sup> decade. This should be developed within management areas on both dry-mesic and dry-xeric sites based on the following:

**Hardwood/Grassland/Shrubland (acres)**

Management Area	Decade 1
Licking River	90-110
Middle Kentucky River	90-110
Upper Kentucky River	150-180
Cumberland River	270-330
<b>Total</b>	<b>600-730</b>

<sup>19</sup> The objective is to restore areas that were pine and pine-hardwood, prior to the southern pine beetle epidemic. Any pine stands remaining, that meet the new desired condition for forest, woodland or wooded grassland will be considered restored when stand inventory indicates adequate stocking for the condition desired.

**1.K-Objective 2.F.** Establish and maintain 5,320 to 6,970 acres of hardwood and hardwood-yellow pine woodland in the 1<sup>st</sup> decade. This should be developed within management areas on both dry-mesic and dry-xeric sites based on the following:

**Hardwood Woodland (acres)**

Management Area	Decade 1
Licking River	800-1045
Middle Kentucky River	800-1045
Upper Kentucky River	1,330-1,745
Cumberland River	2,390-3,135
<b>Total</b>	5,320-6,970

**1.K-Objective 2.G.** Maintain with fire, 31,500 to 42,000 acres in upland oak and upland oak-yellow pine forest. This should be developed on both dry-mesic and dry-xeric sites.

**1.K-Goal 3.** For projects that will increase the production, transmission or conservation of energy, evaluate Federal mineral project proposals in a timely manner while addressing safety, public health, and environmental protection considerations.

## Standards

### RECREATION

**1.K-REC-1.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, roaded natural, and rural.

### VEGETATION

**1.K-VEG-1.** When 9 inch dbh snags are not available or cannot be created to meet a minimum of 3 snags per acre, snags of at least 6 inches dbh may be retained or created to provide snag habitat.

## 1M. CUSTODIAL AREA

### Setting

Unless allocated to another Prescription Area, National Forest System land is allocated to the Custodial Prescription Area. It may consist of small to large parcels that may be adjacent to, or possibly surrounded by, other Prescription Areas.

This Prescription Area is currently estimated at approximately 395,200 acres across the DBNF.

This Prescription Area has 70,000 acres classified as Suitable for Timber Production (Scheduled Harvest) – Non-timber emphasis to insure minimum viability within the DBNF. The remainder is Unsuitable for Timber Production – Timber Harvest is not allowed.

### Desired Future Condition

**Emphasis of Condition:** This is an area where the natural interactions of organisms with each other and with their environment (ecological processes) continue with a minimum of direct human influence. Characteristics of the forest environment are affected primarily by natural disturbance factors such as insects, disease, fire, and weather. Existing recreational facilities are maintained and human health and safety is protected. Occasional vegetation and fire management is undertaken to meet minimum legal requirements.

**Desired Ecosystem Condition:** Late-successional forests dominate this area. Natural processes such as flooding, ice storms or windstorms, insect and disease outbreaks, and fires are the primary influences to vegetation. Small gaps and occasional large openings of early successional habitat are created through natural disturbance. Standing snags and down woody material, the result of baseline mortality, are common in this area. Natural succession eventually results in a forest of predominantly shade-tolerant vegetation ranging from chestnut oak on xeric sites to sugar maple, red maple, American beech, and white pine and hemlock on moister sites. Old-growth forest communities of all sizes exist. Those stands that have been set back in development due to natural stand-replacing disturbances are progressing again toward an old-growth condition.

Some rare communities and associated species as well as threatened, endangered, sensitive, and locally rare species are abundant; others exist in minimal populations. When needed, a disturbance-related habitat condition is artificially created to provide for minimum viability of species to meet legal requirements. Timber may occasionally be produced as a by-product of such activity.

**Desired Facilities and Activities:** This area provides moderate to large tracts of non-motorized, backcountry recreational opportunities. Outdoor skills are important for visitors in the more remote portions of these areas. Hiking, backpacking, dispersed camping, hunting, and fishing are typical recreational activities. Visitors who travel away from roads and developed campgrounds see little evidence of human disturbance with the exception of trail maintenance and some vegetation manipulation.

Some artificial vegetation disturbance may occur to maintain required minimum species viability or to maintain habitat for threatened, endangered, sensitive, or locally rare species. Timber may occasionally be produced as a by-product of such disturbance. Fire may occasionally be noticed in

the woods, especially during the spring and fall. Development of outstanding and reserved minerals may occur.

### Goals and Objectives:

**1.M-Goal 1.** Maintain this area of the Forest in a natural condition, with minimal human influence.

**1.M-Objective 1.A.** Decommission and obliterate temporary as well as system roads not needed for resource protection or recreation; bring up to standard or relocate those that adversely affect surrounding resource values and conditions.

**1.M-Goal 2.** Maintain and restore existing recreational facilities.

**1.M-Objective 1.B.** Recreation opportunity spectrum (ROS) include: RN1, RN2, SPM, and SPNM. Scenic integrity levels range from “very high” to “high.”

### Standards

#### MINERAL OPERATIONS

**1.M-MIN-1.** Minerals are available for lease only under the controlled-surface use stipulation. Federal mineral development will be allowed only for purposes of national security or national policy.

#### RECREATION

**1.M-REC-1.** This area is closed to OHV use.

#### ROADS/ENGINEERING

**1.M-ENG-1.** Road construction may only occur where road relocation would better protect resources.

#### VEGETATION MANAGEMENT

**1.M-VEG-1.** Insect and disease outbreaks and invasive pests will be controlled where threatened, endangered, proposed, sensitive, or locally rare species and their habitats are likely to be harmed; to prevent damage to resources on adjacent land; or where needed for safety or legal purposes. Biological methods of control should be used where available and effective.

**1.M-VEG-2.** Eradication of recently established non-native pests would be attempted. Biological control of established non-native pests through the release of natural enemies should be used where available and effective.

**1.M-VEG-3.** This land is classified as unsuitable for timber production. Timber may be salvaged after catastrophe, or otherwise cut and/or removed only if needed for safety or legal reasons.

- 1.M-VEG-4. DENSE UNDERSTORY.** Provide 19 blocks, minimum 110 acres each, distributed across all MAs, with the following locations and conditions: 40-60 percent of the block will contain dense hardwood understory, either with or without high canopy forest on damp, mesic slopes, preferably adjacent to the riparian-aquatic prescription area. (Kentucky warbler, American redstart in part)
- 1.M-VEG-5. PINE AND/OR HEMLOCK.** Maintain at least 100 stands containing predominantly mature (80+ years) yellow pine and/or hemlock, minimum 15 acres each, distributed across all management areas. (sharp-shinned hawk- breeding habitat)
- 1.M-VEG-6. PINE WOODLAND AND WOODED GRASSLAND/SHRUBLAND.** Provide 100 blocks, minimum 19 acres each (50 blocks, 38 acres each is preferred), distributed across all management areas (MAs), but with emphasis in the Cumberland and Middle Kentucky MAs, in the following habitat conditions: open to semi-open canopy (30-50 BA) with areas of little to no canopy (0-25 BA) in primarily southern yellow pine forest type, but can include dry-mesic pine-oak, dry-xeric pine-oak, dry-mesic oak, and dry-xeric oak forest types, with little to no midstory, but with areas of shrubs and generally grassy (warm season) herb layer; prescribed fire is beneficial. In addition, other included or adjacent grassland or old fields are likely to provide additional habitat (northern bobwhite quail, field sparrow, prairie warbler, Bachman's sparrow, yellow-throated warbler).
- 1.M-VEG-7. HARDWOOD WOODLAND.** Maintain eight blocks, minimum 25 acres each, in the Upper Kentucky MA with the following conditions: mixed mesophytic and dry-mesic oak forest (at least age 50) with open canopy (30-50 BA), midstory, shrub layers, mixed with openings and forest edge. Use prescribed burning to maintain habitat and promote flowering at known locations of Wasioto rosinweed.
- 1.M-VEG-8. MATURE FOREST, OPEN UNDERSTORY.** Maintain at least 100 blocks, minimum 20 acres each, in the following condition: mature (80+ years old) mixed mesophytic, oak-pine and upland oak with open midstory/shrub layers; with scattered pockets (up to 1 acre) of 40-80 BA and burned areas. Maintain corridors between tracts using cliff zones or riparian zones (yellow-throated vireo).
- 1.M-VEG-9. THINNED FOREST.** Provide at least seven tracts, approximately 250 acres each, distributed in all MAs, but with emphasis in the Cumberland River MA, in the following habitat conditions: semi-open canopy (around 60-70 BA), relatively dry, mature forest >80 years old (20 percent may be 0-80 year-old forest), preferentially dry-mesic pine-oak and dry-xeric pine-oak forest types (dry-mesic oak and dry xeric oak acceptable), with open midstory and shrub layers, in which burning and/or midstory treatments have occurred. Provide at least 15 snags/10 acres >14 inches dbh, where available. Include approximately 5 percent of each block in permanent grassy/low shrub openings (at least two, minimum one acre) (summer tanager, red-headed woodpecker, yellow-throated vireo, eastern wood pewee, northern flicker, Chuck-will's widow).
- 1.M-VEG-10. WOODLAND AND WOODED GRASSLAND/ SHRUBLAND.** Provide at least 67 blocks distributed in all MAs (minimum 30 blocks total in Cumberland MA and 15 in Middle Kentucky MA), approximately 45 acres each, in the following habitat conditions: dry, mature (70-80 years +) forest (preferentially dry-mesic pine-oak and dry-xeric pine-oak, but dry-mesic oak and dry xeric oak and general forest acceptable) with semi-open to open

canopy (around 40-50 BA woodland) with open midstory and shrub layers, with at least 15 (>14 inches dbh) snags/10 acres. Approximately 20 percent of each block will be maintained in a combination of grassy openings and wooded grassland/shrubland. Burn blocks to maintain grassy/low shrub conditions (red-headed woodpecker, yellow-throated vireo, eastern wood pewee, northern flicker, summer tanager, chipping sparrow, Chuck-will's widow, prairie warbler).

**1.M-VEG-11. SMALL MOIST GRASSY OPENINGS.** Provide at least 100 generally forested blocks, minimum 12 acres each, distributed in all MAs. Each block will have one to two acres of openings. Each opening will contain the following habitat at least one-quarter acre in size: open ground, all with moist, poorly drained soils, considering areas such as bare ground, old fields, cultivated land, pastures, grassy openings, and one- to three-year-old regeneration areas on both National Forest and other ownerships. Needs edge habitat containing high shrub density areas and areas providing partial to wet thickets along meandering streams or swampy ground are preferred (American woodcock).

**1.M-VEG-12. SHRUB-SAPLING OPENINGS.** Provide at least 700 acres, in 50-100 blocks, seven acres each, (blocks may be clustered) in the following conditions: dense cover of shrubs and or hardwood saplings (50-100 percent hardwood.) with little to no canopy (0-20 BA of trees >2.0 inches dbh), includes dense brushy openings with approximately equal distribution across all MAs, but at least ten blocks each in the Upper Kentucky MA and the Jellico Mountains area of the Cumberland MA. These blocks will be fixed areas (yellow-breasted chat, goldenwing warbler, in part).

**1.M-VEG-13. PINE FOREST, MIXED AGE.** Provide at least 100 blocks, minimum 330 acres each, distributed in the Licking MA (five blocks), in the Middle Kentucky MA (30 blocks), and the Cumberland MA (65 blocks), in predominantly forested land of which one-half is mature (80+ years) dry-mesic pine-oak, dry-xeric pine-oak and/or southern yellow pine (30-100 percent pine component) with open canopy (60 –70 BA) and little to no midstory. Include at least 20 acres of woodland in conjunction with five acres of savanna and five acres of warm season grassy openings in 50 of the blocks. Must include pines >20 inches dbh. (sharp-shinned hawk – foraging habitat, yellow-throated warbler, northern bobwhite quail, field sparrow).

**1.M-VEG-14. GRASSY OPENINGS.** Provide at least 100 blocks, of minimum seven acres each, distributed in all Management Areas, in predominantly grass cover. At least half of the blocks are to be warm season grass (field sparrow; northern bobwhite quail, prairie warbler in part).

## **FIRE MANAGEMENT**

**1.M-FIRE-1.** Prescribed fire is not to be used as a management tool unless needed for safety or legal reasons such as maintenance of species viability, management of threatened or endangered species, or to control non-native pests.

**1.M-FIRE-2.** Naturally occurring wildland fire is not to be suppressed unless it threatens private land, infrastructure, or habitat for species whose continued viability is concern. A burn plan must also be prepared in advance of ignition.



## 2.A. CLIFTY WILDERNESS

### Setting

This Prescription Area, congressionally designated under the authority of the Kentucky Wilderness Act of 1985, consists of approximately 12,000 acres within the Middle Kentucky River Management Area.

This Prescription Area is Unsuitable for Timber Production – Timber harvest not allowed.

### Desired Future Condition

**Emphasis of Condition:** This is a primitive place where natural ecological succession is allowed to operate freely to the extent feasible. Little evidence of human activity can be detected. Congress has designated this area as a place where humans influence nature as little as possible.

**Desired Ecosystem Conditions:** Mostly late-successional and old-growth forests characterize the area including many areas of white pine and hemlock. Naturally occurring openings are available as early successional habitat. Natural ecological conditions and processes prevail. The forest conditions meet habitat requirements for species requiring dense forest cover and downed woody debris, as well as for area-sensitive interior species. Fish and aquatic populations remain relatively stable.

**Desired Facilities and Human Activities:** This area is managed toward a Primitive Recreation Opportunity Spectrum (ROS) experience. Facilities are not desired here. Dispersed recreation occurs, but evidence of other humans is not easily detected. An occasional visitor might be found hiking, hunting, fishing, or camping. There are a few primitive trails, maintained primarily to disperse use and minimize user impacts, not for visitor convenience.

### Goals and Objectives

**2.A-Goal 1.** Allow natural processes to proceed while managing visitor use at a level compatible with the Wilderness resource without loss of solitude or unacceptable depreciation of Wilderness qualities.

**2.A-Objective 1.A.** Natural processes will be relied upon to recover degraded Wilderness resources unless damage will continue, without intervention.

**2.A-Objective 1.B.** Develop a fire management plan that would allow fire to play, as nearly as possible, its natural ecological role, under documented, preplanned, specified conditions; while allowing for suppression of any fire that threatens Wilderness resources, threatens life or property, or poses a threat to human health and safety.

**2.A-Goal 2.** Provide opportunities for primitive, dispersed recreation featuring the “naturalness” of the environment, solitude, physical and mental challenge, and inspiration that is consistent with preservation of the Wilderness resource.

**2.A-Objective 2.A.** Manage the social and managerial setting for primitive recreation opportunity spectrum experiences that provide a high degree of solitude, self-reliance and challenge.

**2.A-Objective 2.B.** Manage the area to maintain Scenic Integrity of Very High.

**2.A-Objective 2.C.** Provide resources and information to visitors entering the Wilderness so they have “wilderness awareness” and practice a “leave no trace” ethic. They should understand that:

- a) Wilderness is primitive and rugged
- b) Outdoor skills are necessary for using wilderness
- c) They have a responsibility for their own safety
- d) They will need to leave the wilderness as they found it.

**2.A-Objective 2.D.** Complete the Limits of Acceptable Change process with public input.

**2.A-Objective 2.E.** Design and manage the trail system consistent with Wilderness objectives for solitude, physical and mental challenge, spirit of adventure, and self-reliance. Trail design will control the level of public use. Long-distance trails, which pass through the Wilderness, such as the Sheltowie Trace National Recreation Trail, will be consistent with Wilderness management trail guidelines.

**2.A-Goal 3.** Designate camping areas when needed to minimize environmental impacts.

**2.A-Goal 4.** Maintain a close relationship with all state, county, and local agencies to provide a common understanding of Wilderness purpose and values to the area.

**2.A-Objective 4.A.** Continue to coordinate law enforcement search and rescue efforts with Kentucky State Police, local sheriffs’ departments, Kentucky Department of Fish and Wildlife Resources, other local officials and entities. Strengthen the cooperators’ role.

**2.A-Objective 4.B.** Work with state and federal air regulatory agencies to achieve the protection appropriate for this Class II Wilderness area.

**2.A-Goal 5.** Facilitate scientific study that is dependent on a natural setting: a) that seeks to explain wilderness phenomena; and b) which is conducted in an unobtrusive manner consistent with the preservation of the Wilderness resource.

**2.A-Goal 6.** Achieve a consolidated pattern of National Forest System land and/or mineral ownership that facilitates management of the Wilderness area without infringing on the rights of private owners. Acquire private in-holdings or interests as they become available to better manage the area as wilderness.

**2.A-Objective 6.A.** Subject to valid existing rights, existing access routes to private in-holdings and cemeteries will be brought under the necessary permit and closed to unauthorized use.

**2.A-Goal 7.** Remove those sites or structures that do not qualify for the National Register of Historic Places or allow them to deteriorate naturally, unless they are deemed necessary to support wilderness or for administrative purposes outlined in Section 4 (c) of the Wilderness Act.

**2.A-Goal 8.** Provide protection for known PETS species populations and aid recovery of habitat and populations in areas of their previous habitation.

## Standards

### LANDS

**2.A-LAND-1.** Allow no special uses that are inappropriate for the wilderness setting.

### MINERALS

**2.A-MIN-1.** Subject to valid rights effective prior to wilderness designation, all federal minerals in wilderness areas are withdrawn from leasing.

**2.A-MIN-2.** Surface mitigating measures will be implemented in the development of privately owned minerals.

### ROAD/ENGINEERING

**2.A-ENG-1.** Road closures will use permanent closure methods that appear natural, using such methods as boulder placement, slope restoration, etc. Closed roads will be naturally revegetated. If the area is not expected to revegetate naturally in a reasonable time, revegetate area using native species only.

**2.A-ENG-2.** The use of motorized equipment is not allowed unless approved by the appropriate Forest Service Line Officer within their delegated authority.

### RECREATION

**2.A-REC-1.** Allow no horses or other livestock in this area except on trails designated for such use or as specifically permitted.

**2.A-REC-2.** Regulation, including designating primitive campsites, will be used only to control the adverse physical and social impacts of human use. Utilize a permit system only when Limits of Acceptable Change standards are exceeded and cannot be met through less restrictive techniques.

**2.A-REC-3.** Camping is not permitted within 100 feet of the base of any cliff or the back of any rockshelter, unless at a designated site.

**2.A-REC-4.** No campfire or stove fire is permitted within 100 feet of the base of a cliff, or the back of any rockshelter, unless at a designated site.

**2.A-REC-5.** No new rock climbing routes with fixed anchors are allowed. However, maintenance or replacement of existing approved fixed anchors is allowed by non-mechanized means.

**2.A-REC-6.** Upon completion of Limits of Acceptable Change process, outfitter/guiding will be permitted based on the LAC analysis.

**2.A-REC-7.** Forest Supervisor approval is required for all research projects.

**2.A-REC-8.** Until the limits of acceptable change process is completed, limit the size of groups to no more than 10 people. Groups over 10 may be allowed only under permit on a case-by-case basis when compatible with Wilderness management objectives.

**2.A-REC-9.** Mark research plots in an inconspicuous manner not visually evident to the average user.

## VEGETATION

**2.A-VEG-1.** Do not control insect or disease outbreaks unless necessary to prevent unacceptable damage to resources on adjacent lands, or to prevent an unacceptable loss to the wilderness resource due to non-native invasive pests.

**2.A-VEG-2.** Collection of non-timber forest products in the Clifty Wilderness area is allowed only for scientific purposes, with Forest Supervisor approval.

## WILDLAND FIRE

**2.A-FIRE-1.** Allow the use of aircraft for wildland fire detection, but not for suppression unless approved by the Forest Supervisor on a case-by-case basis.

**2.A-FIRE-2.** Mechanized or motorized equipment will not be used for wildland fire suppression efforts unless approved by the Regional Forester or Forest Supervisor within their delegated authority.

**2.A-FIRE-3.** Do not permit emergency burned area rehabilitation unless necessary to prevent an unnatural loss of the wilderness resource or to protect life, property and other resource values outside of the wilderness.

**2.A-FIRE-4.** Do not use prescribed fire for the primary purpose of benefiting wildlife, maintain vegetative types or enhance other resource values.

## 2.B. BEAVER CREEK WILDERNESS

### Setting

This Prescription Area, which is congressionally designated under the authority of the Eastern Wilderness Act of 1975, consists of approximately 5,000 acres within the Cumberland River Management Area.

This Prescription Area is Unsuitable for Timber Production – Timber harvest not allowed.

### Desired Future Condition

**Emphasis of Condition:** This is a primitive place where natural ecological succession is allowed to operate freely to the extent feasible. Little evidence of human activity can be detected. Congress has designated this area as a place where humans influence nature as little as possible.

**Desired Ecosystem Conditions:** Mostly late-successional and old-growth forests characterize the area. Naturally occurring openings are available as early successional habitat. Natural ecological conditions and processes prevail. The forest conditions meet habitat requirements for species requiring dense forest cover and downed woody debris, as well as for area-sensitive interior species. Fish and aquatic populations remain relatively stable.

**Desired Facilities and Human Activities:** This area is managed toward a Primitive Recreation Opportunity Spectrum (ROS) experience. Facilities are not desired here. Dispersed recreation occurs, but evidence of other humans is not easily detected. An occasional visitor might be found hiking, hunting, fishing, or camping. There are a few primitive trails, maintained primarily to disperse use and minimize user impacts, not for visitor convenience.

### Goals and Objectives

**2.B-Goal 1.** Allow natural processes to proceed while managing visitor use at a level compatible with the wilderness resource without loss of solitude or unacceptable depreciation of wilderness qualities.

**2.B-Objective 1.A.** Natural processes will be relied upon to recover degraded wilderness resources unless damage will continue, without intervention.

**2.B-Objective 1.B.** Develop a fire management plan that would allow fire to play, as nearly as possible, its natural ecological role, under documented, preplanned, specified conditions; while allowing for suppression of any fire that threatens Wilderness resources, threatens life or property, or poses a threat to human health and safety.

**2.B-Goal 2.** Provide opportunities for primitive, dispersed recreation featuring the “naturalness” of the environment, solitude, physical and mental challenge, and inspiration that is consistent with preservation of the Wilderness resource.

**2.B-Objective 2.A.** Manage the social and managerial setting for primitive recreation opportunity spectrum experiences that provide a high degree of solitude, self-reliance and challenge.

**2.B-Objective 2.B.** Manage the area to maintain a Very High level of Scenic Integrity.

**2.B-Objective 2.C.** Provide resources and information to visitors entering the Wilderness so they have “wilderness awareness” and practice a “leave no trace” ethic. They should understand that:

- a) Wilderness is primitive and rugged
- b) Outdoor skills are necessary for using wilderness
- c) They have a responsibility for their own safety
- d) They will need to leave the wilderness as they found it.

**2.B-Objective 2.D.** Design and manage the trail system consistent with Wilderness objectives for solitude, physical and mental challenge, spirit of adventure, and self-reliance. Trail design will control the level of public use. Long-distance trails, which pass through the Wilderness, such as the Sheltowee Trace National Recreation Trail, will be consistent with Wilderness management trail guidelines.

**2.B-Goal 3.** Designate camping areas when needed to minimize environmental impacts.

**2.B-Goal 4.** Maintain a close relationship with all state, county, and local agencies to provide a common understanding of Wilderness purpose and values to the area.

**2.B-Objective 4.A.** Continue to coordinate law enforcement search and rescue efforts with Kentucky State Police, local sheriffs’ departments, Kentucky Department of Fish and Wildlife Resources, other local officials and entities. Strengthen the cooperators’ role.

**2.B-Objective 4.B.** Work with state and federal air regulatory agencies to achieve the protection appropriate for this Class II Wilderness area.

**2.B-Goal 5.** Facilitate scientific study that is dependent on a natural setting: a) that seeks to explain wilderness phenomena; and b) which is conducted in an unobtrusive manner consistent with the preservation of the wilderness resource.

**2.B-Goal 6.** Achieve a consolidated pattern of National Forest System land and/or mineral ownership that facilitates management of the Wilderness area without infringing on the rights of private owners. Acquire private in-holdings or interests as they become available to better manage the area as wilderness.

**2.B-Objective 6.A.** Subject to valid existing rights, existing access routes to private in-holdings and cemeteries will be brought under the necessary permit and closed to unauthorized use.

**2.B-Goal 7.** Remove sites or structures that do not qualify for the National Register of Historic Places or allow them to deteriorate naturally, unless they are deemed necessary to support wilderness or for administrative purposes as outlined in Section 4(c) of the Wilderness Act.

**2.B-Goal 8.** Provide protection for known PETS species populations and aid recovery of habitat and populations in areas of their previous habitation.

## Standards

### LANDS

**2.B-LAND-1.** Allow no special uses that are not in keeping with the wilderness setting.

### MINERALS

**2.B-MIN-1.** Subject to valid rights effective prior to wilderness designation, all federal minerals in wilderness areas are withdrawn from leasing.

**2.B-MIN-2.** Surface mitigating measures will be implemented in the development of privately owned minerals.

### ROADS/ENGINEERING

**2.B-ENG-1.** Road closures will use permanent closure methods that appear natural, using such methods as boulder placement, slope restoration, etc. Closed roads will be naturally revegetated. If the area is not expected to revegetate naturally in a reasonable time, revegetate area using native species only.

**2.B-ENG-2.** The use of motorized ground vehicles is not allowed unless approved by the appropriate Forest Service Line Officer within their delegated authority.

### RECREATION

**2.B-REC-1.** Allow no horses or other livestock except on trails designated for such use, or as specifically permitted.

**2.B-REC-2.** Regulation, including designating primitive campsites, will be used only to control the adverse physical and social impacts of human use.

**2.B-REC-3.** Camping is not permitted within 100 feet of the base of any cliff or the back of any rockshelter, unless at a designated site.

**2.B-REC-4.** No campfire or stove fire is permitted within 100 feet of the base of a cliff, or the back of any rockshelter, unless at a designated site.

**2.B-REC-5.** No new rock climbing routes with fixed anchors are allowed. However, maintenance or replacement of existing approved fixed anchors is allowed by non-mechanized means.

**2.B-REC-6.** Forest Supervisor approval is required for all research projects.

**2.B-REC-7.** Until the limits of acceptable change process is completed, limit the size of groups to no more than 10 people. Groups over 10 may be allowed only under permit on a case-by-case basis when compatible with Wilderness management objectives.

**2.B-REC-8.** Mark research plots in an inconspicuous manner not visually evident to the average user.

**VEGETATION**

- 2.B-VEG-1.** Do not control insect or disease outbreaks unless necessary to prevent unacceptable damage to resources on adjacent lands, or to prevent an unnatural loss to the Wilderness resource due to non-native invasive pests.
- 2.B-VEG-2.** Collection of non-timber forest products in the Beaver Creek Wilderness area is allowed only for scientific purposes, with Forest Supervisor approval.

**WILDLAND FIRE**

- 2.B-FIRE-1.** Allow the use of aircraft for wildland fire detection, but not for suppression unless approved by the Forest Supervisor on a case-by-case basis.
- 2.B-FIRE-2.** Mechanized or motorized equipment will not be used for wildland fire suppression efforts unless approved by the Regional Forester or Forest Supervisor within their delegated authority.
- 2.B-FIRE-3.** Do not permit emergency burned area rehabilitation unless necessary to prevent an unnatural loss of the Wilderness resource or to protect life, property and other resource values outside of the Wilderness.
- 2.B-FIRE-4.** Do not use prescribed fire for the primary purpose of benefiting wildlife, maintain vegetative types or enhance other resource values.



## 2.C. WILDERNESS STUDY AREA

### Setting

Wolfpen Inventoried Roadless Area is on the western edge of Clifty Wilderness.

The Wolfpen Inventoried Roadless Area consists of 2,834 acres.

This Prescription Area is Unsuitable for Timber Production – Timber harvest not allowed.

### Desired Future Condition

**Emphasis of Condition:** This is a primitive place, exhibiting “old-growth” conditions, with many large trees, snags and rotting deadfalls. Little evidence of humans can be detected.

**Desired Ecosystem Conditions:** Mostly late-successional and older forests characterize the area. Naturally occurring openings are available as early successional habitat but are uncommon. Natural ecological conditions and processes prevail. The forest conditions meet habitat requirements for species requiring dense forest cover and downed woody debris, as well as for area-sensitive interior species. Fish and aquatic populations remain relatively stable.

**Desired Facilities and Human Activities:** This area is managed to provide “primitive” recreational opportunities. Additional Facilities are absent. Dispersed recreation occurs, but evidence of other humans is not easily detected. An occasional visitor might be found hiking, hunting, fishing or camping. There are a few primitive trails, maintained primarily to disperse use and minimize user impacts. Existing private access roads are maintained to provide existing access with a minimum impact on the land.

### Goals and Objectives

**2.C. Goal 1.** Follow the Goals, Objectives and Standards of Prescription 3E for Wolfpen Roadless Area adjacent to the Clifty Wilderness and 1C, 1E, 1G, 1I, 1J, 1K as they apply for all other areas except: Allow natural processes to proceed while managing activities and visitor use, without loss of solitude or depreciation of wilderness qualities.

**2.C. Goal 2.** Provide opportunities for primitive, dispersed recreation featuring the “naturalness” of the environment, solitude, physical and mental challenge, and inspiration that is consistent with preservation of the wilderness characteristics.

### 3.A. DEVELOPED RECREATION AREAS

#### Setting

This Prescription Area, found in all Management Areas, is estimated at approximately 3,700 acres across the DBNF.

This Prescription Area is Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

#### Desired Future Condition

**Emphasis of Condition:** These areas contain facilities, services, and settings designed for human activities that do not exceed site capability but provide at least a minimum level of human needs. These facilities include campgrounds, picnic areas, boat ramps, interpretive sites, overlooks, swimming areas, and trailheads. Management emphasis is placed on services and facilities that fill market niches best provided by the National Forest. Cost-effective operation of facilities is a major, but not the only consideration. Facilities that provide little public service for the operating and maintenance costs involved are considered for closure, change in operations, or redesigned. While some recreation areas may have modifications to handle large numbers of people and provide desired amenities, these areas retain the sense of a natural environment and aesthetically blend with their surroundings. Visitors feel comfortable bringing their entire family to participate in appropriate site activities. These sites serve as “gateways” to the wide diversity of recreational opportunities on the remainder of the Forest.

**Desired Ecosystem Conditions:** These areas have facilities that are generally shaded and screened by various tree and shrub species. The surrounding forested transition provides for esthetic values. Within these surrounding areas, a variety of wildlife and plants are available for viewing or study. Rare communities of plants and animals are not normally found in these areas, but are protected where they occur.

**Desired Facilities and Human Activities:** Facilities are designed to fit the landscape based upon site activity type and capacity. They provide for minimal human needs in addition to safety and security. Based upon the characteristics of the land as well as intended uses, sites are available for use by visitors with disabilities.

Each site is designed to support specific activities appropriate to the area. Sites are designed and managed to encourage positive human interaction as well as interaction between humans and the environment. Human activity is concentrated at sites designed to reduce impacts to the environment. Vegetation management is used primarily to maintain the health of trees and shrubs, to maintain the shade and air circulation necessary to enhance the recreation experience, and to ensure visitor safety.

These facilities are managed for one of the following four<sup>20</sup> development levels of the Recreation Opportunity Spectrum (ROS) experiences:

**Development Level 5:** Highly developed sites provide experiences expected in a more “urban” forest setting. Numerous facilities of mostly non-native materials and very refined design can be expected. Convenience facilities are prevalent, including showers, flush toilets, paved roads and trails, entrance stations, playgrounds, beaches, and recreation vehicle hookups. Paved, striped roads access facilities. The Experiences best representing this level is Urban.

**Development Level 4:** Heavily developed sites provide experiences expected in a rural-urban interface area. Access is by double-lane gravel or paved roads. Some complex facilities with some non-native but harmonious materials are present. Many convenience facilities such as flush toilets, lighting, and piped-in water may be available. Moderate to heavy site modification occurs. The Experiences best representing this level are either Urban or Rural.

**Development Level 3:** Moderately developed recreation areas provide experiences expected in a more rustic setting. Some privacy is expected. Gravel roads capable of accommodating conventional motorized vehicles including sedans with trailers, and smaller motor homes, provide access. Facilities are developed for protection of the site as well as for user convenience. These may include vault or chemical toilets, graveled site pads, picnic tables, and grills or fire rings. The Experiences best representing this level are Roaded Modified or Roaded Natural.

**Development Level 2:** Minimally developed recreation sites offer an opportunity for solitude, tranquility, and closeness to nature. These sites offer visitors a higher degree of self-reliance, challenge, and risk. There is normally a low concentration of users in this area. Vegetative alterations, very small in size and number, are primarily for public safety. They are widely dispersed and blend with the natural vegetation. Minimal site modification is required for the limited facilities as well as for safety and resource protection. Facilities are normally constructed from native-appearing, rustic materials. The Experiences best representing this level are Roaded Natural or Semi-Primitive Motorized.

## Goals and Objectives

**3.A-Goal 1.** Provide areas that are safe, cost-effective to operate, and meet the target market population’s needs that are best served on National Forest System lands.

**3.A-Objective 1.A.** Through collection and analysis of pertinent data develop a core mission/niche for the Forest’s recreation program to guide planning and development.

**3.A-Objective 1.B.** Apply business principles to ensure sustainable developed recreation services and facilities with measurable performance standards.

<sup>20</sup> Development Level 1, Dispersed Sites with Minimum Site Modification, are not inventoried as developed recreation sites.

**3.A-Goal 2.** Assign each facility a development level and associated Experiences. Design and operate in compliance with the assigned development level and Experiences in a safe, cost-effective manner.

**3.A-Objective 2.A.** Develop annual district-level operations and maintenance plans for developed recreation facilities. These should include annual monitoring and mitigation of any health or safety problems.

**3.A-Goal 3.** Use developed recreation areas as an opportunity to provide conservation education and interpretive programs.

## Standards

### LANDS

**3.A-LAND-1.** Non-recreation special uses are not to be permitted in these areas unless they are for the purpose of serving the public in ways appropriate for these areas, or to serve some other Forest Service objective.

### MINERALS

**3.A-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity; development of federally owned oil and gas is subject to the no surface occupancy stipulation.

### RECREATION/SCENERY

**3.A-REC-1.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, roaded natural and rural.

### VEGETATION

**3.A-VEG-1.** Collection of non-timber forest products is not allowed, except for scientific purposes.

### 3.B. LARGE RESERVOIRS

#### Setting

This Prescription Area consists of the water surface at summer pool, and a 300-foot wide zone inland from the water's edge at summer pool, of the entire National Forest shoreline of Cave Run Lake, Laurel River Lake and Lake Cumberland.

This Prescription area consists of 30,600 acres in the Cumberland River and Licking River Management Areas.

This Prescription Area is Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

#### Desired Future Condition

**Emphasis of Condition:** These reservoirs provide quality water-based opportunities for recreation in a natural setting. Developed access and recreation sites along trash free shorelines are provided and managed in accordance with Prescription 3.A as long as such management does not conflict with flood control or power generation.

**Desired Ecosystem Conditions:** Water in these reservoirs meets the state and federal standards. Vegetative diversity exists that provides a variety of plants that support fisheries and wildlife. Submergent and emergent vegetation is present in shallows. Sport fish species are abundant. Where applicable, water quality is suitable for municipal water supplies. Non-native, invasive flora and fauna are not present.

**Desired Facilities and Human Activities:** The reservoirs provide for family oriented activities, including permitted recreation events and outfitting-guiding that promote positive, sustainable tourism for the locale and region. A variety of boats are seen on the lake surface. Recreation use is concentrated at permitted, privately owned marinas, as well as developed Forest Service recreation sites and boat ramps. Direct contact with other users at these locations is highly probable. Use decreases as one moves away from these sites to the point that a feeling of solitude may occur at times in some areas of these reservoirs. Contact with other users is sporadic and is controllable by the user, by choosing the area and the time of visit. The reservoirs range from very busy, active, and crowded, to solitary or deserted. The reservoirs are managed to provide differing levels of development and human activities in various areas of the reservoir and along the shoreline. Water-based activities, particularly boating, are managed to ensure safety. Management activities and shoreline developments make few dominating visual impacts when viewed from the reservoirs.

Occasionally, management activities include the use of motorized equipment to maintain existing roads and trails. Vegetation may be occasionally manipulated to maintain the conditions that are consistent with the area's designation. Trees damaged or knocked down following unforeseen events such as wildland fire, wind, snow, and insect and disease outbreaks might be removed for public safety or to facilitate restoration toward the conditions that are consistent with the area's designation. Tree felling and removal using motorized equipment could occur. Fire suppression activities could include the use of heavy equipment to construct firelines, while aircraft may provide detection and suppression support. Evidence of prescribed burning may be found.

## Goals and Objectives

**3.B-Goal 1.** Manage reservoirs to maintain water quality that meets state and federal standards.

**3.B-Objective 1.A.** Promote water quality improvement through environmental education, law enforcement, and special events.

**3.B-Objective 1.B.** As soon as possible after their discovery in a reservoir, take actions to eradicate non-native, invasive flora and fauna.

**3.B-Goal 2.** Manage lake shorelines to maintain natural appearance when viewed from the water despite scattered areas of development.

**3.B-Objective 2.A.** Acquire private lands and mineral rights in reservoir viewsheds when possible.

**3.B-Goal 3.** Where not in conflict with flood control or power generation objectives, manage reservoirs to provide safe, family oriented, water-based recreation experiences.

**3.B-Goal 4.** Improve wildlife and fisheries habitat to enhance wildlife viewing and fishing opportunities.

**3.B-Goal 5.** Provide cost-effective recreational access to reservoirs that complements existing recreational facilities.

**3.B-Goal 6.** Manage reservoirs so users can enjoy various recreation experiences, from solitude in natural environments to high levels of human interaction near developed areas.

**3.B-Goal 7.** Provide for quality lake recreation and lakeshore fish and wildlife habitat.

**3.B-Goal 8.** Provide non-recreation special use authorizations when necessary for basic public service and to meet other Forest Service objectives, where no reasonable options are available.

**3.B-Goal 9.** Provide recreation-related events under special use authorization such as fishing tournaments, and outfitter-guide services.

## Standards

### MINERALS

- 3.B-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity; development of federally owned oil and gas is subject to the no surface occupancy stipulation.

### RECREATION/SCENERY

- 3.B-REC-1.** Camping is not allowed within 300 feet of the shoreline of Cave Run Lake or Laurel River Lake, except where designated by the Forest Service.
- 3.B-REC-2.** Prohibit the landing of seaplanes on Cave Run and Laurel River Lakes.
- 3.B-REC-3.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, roaded natural and rural.
- 3.B-REC-4.** Marina concessionaires for boats on Cave Run Lake and Laurel River Lake will provide sewage disposal facilities.

### VEGETATION

- 3.B-VEG-1.** Vegetation management will only occur:
- a) To maintain or protect existing facilities or for the construction of new facilities
  - b) To improve forest health conditions
  - c) When needed to protect or restore the natural ecosystem of the area
  - d) To allow a point of interest to be viewed
  - e) To provide for fish and wildlife habitat
  - f) To protect the public.

### 3.C.1. RED RIVER NATIONAL WILD AND SCENIC RIVER: WILD RIVER SEGMENT

#### Setting

This 9.1-mile segment of the Red River, located mainly within the Clifty Wilderness Prescription Area, is managed as an integral part of this wilderness to maintain the primitive, wild condition where natural ecological conditions and processes prevail. This area is classified as a Wild and Scenic River under P.L. 95-625. It is also designated a Kentucky Wild River by the Commonwealth of Kentucky. This Prescription Area contains 683 acres in the Middle Kentucky River Management Area.

This Prescription Area is Unsuitable for Timber Production – Timber harvest not allowed.

#### Desired Future Condition

**Emphasis of Condition:** This area is part of the Clifty Wilderness. Little evidence of human activity can be detected here. The free-flowing condition, water quality, and Outstandingly Remarkable Values that qualified this stream segment as a National Wild and Scenic River are protected and enhanced.

**Desired Ecosystem Condition:** The river corridor provides for natural succession and maturing of forest stands into an old-growth, late-successional condition. On flood plains, forests are dominated by species such as sycamore, river birch, green ash, boxelder, and occasionally American beech, yellow-poplar, eastern hemlock, and white oak. Lower slopes, and mid to upper slopes with north or east aspect, are dominated by mixed mesophytic forest composed of yellow-poplar, American beech, yellow buckeye, white ash, eastern hemlock, sugar maple, with various oaks, hickories and occasional species such as butternut, black walnut, black birch, American basswood, and white pine. Mid to upper slopes with south or west aspect are dominated by oaks with numerous occurrences of species associated with mixed mesophytic forests. Yellow pines may occur on the most exposed sites. Forest openings occur naturally.

The river is free flowing and relatively free of human-caused pollutants. Water quality meets federal and state standards.

**Desired Facility and Human Activities:** This area is managed as Wilderness to provide a Semi-primitive Non-motorized Recreation Opportunity Spectrum (ROS) experience near trails, access points, and other areas of concentrated use. In other more remote areas, Primitive recreation experiences are available. Access to the river corridor is limited to a few primitive hiking trails provided to protect natural resources rather than for human comfort or convenience. People are challenged to rely on their own physical abilities and follow primitive “leave no trace” recreational pursuits. Facilities, such as trailheads and bulletin boards, are usually located outside the Wilderness. Hiking, primitive camping, rock climbing, fishing, hunting, canoeing, kayaking, and rafting are allowed where they do not adversely impact the wilderness resource.



## Goals and Objectives

**3.C.1-Goal 1.** Maintain and enhance the natural character of the river and its corridor by reducing adverse impacts from private development and use.

**3.C.1-Objective 1.A.** Acquire private lands and mineral rights from willing sellers within the river corridor.

**3.C.1-Objective 1.B.** Make trash clean up a priority using public information and interpretive programs.

**3.C.1-Goal 2.** Protect and enhance the Outstandingly Remarkable Values that qualified this area as a Wild and Scenic River. These are: scenic, recreational, geological, heritage, aquatic, and botanical values.

**3.C.1-Objective 2.A.** Protect and maintain significant heritage resources in consultation with the State Historic Preservation Officer and interested federally recognized tribes.

**3.C.1-Objective 2.B.** Maintain the river's free-flowing condition. Ensure that it meets federal and state water quality standards.

**3.C.1-Objective 2.C.** Maintain and enhance the recreational opportunities associated with the river and its corridor.

**3.C.1-Objective 2.D.** Coordinate with the Kentucky Natural Resources and Environmental Protection Cabinet on management of this Kentucky Wild River in accordance with current or future agreements.

**3.C.1-Objective 2.E.** Protect the aquatic and riparian habitats that support native species.

**3.C.1-Objective 2.F.** Complete limits of acceptable change process with public input.

## Standards

### MINERALS

**3.C.1-MIN-1.** The lands within ¼ mile of the Wild River bank are statutorily withdrawn from operation of the mineral leasing laws.

### ENGINEERING

**3.C.1-ENG-1.** Any water resources project will be evaluated under the appropriate standard of Section 7 of the Wild and Scenic Rivers Act.

### RECREATION

**3.C.1-REC-1.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experienceness of semi-primitive non-motorized, and semi-primitive motorized.

### 3.C.2. PROPOSED WILD AND SCENIC RIVER: MARSH CREEK WILD RIVER SEGMENT

#### Setting

This Prescription Area consists of seven miles of river and 1,240 acres in the Cumberland River Management Area. This river segment has been proposed by the Forest as suitable for federal designation as a Wild and Scenic River. Final action on this designation is pending.

This Prescription Area is Unsuitable for Timber Production – Timber harvest not allowed.

#### Desired Future Condition

**Emphasis of Condition:** The northern seven miles of Marsh Creek will be managed as a primitive, wild area where natural ecological conditions and processes prevail with little evidence of human influence. The Outstandingly Remarkable Values that qualified this stream as a proposed National Wild River segment will be protected and enhanced.

**Desired Ecosystem Condition:** This stream is an area exhibiting natural succession and maturing of forest stands into an old-growth, late-successional condition. On flood plains, forests are dominated by species such as sycamore, river birch, green ash, boxelder, and occasionally American beech, yellow-poplar, eastern hemlock, and white oak. Lower slopes, and mid to upper slopes with north or east aspect, are dominated by mixed mesophytic forest composed of yellow-poplar, American beech, yellow buckeye, white ash, eastern hemlock, sugar maple, with various oaks, hickories and occasional species such as butternut, black walnut, black birch, American basswood, and white pine. Mid to upper slopes with south or west aspect are dominated by oaks with numerous occurrences of species associated with mixed mesophytic forests. Yellow pines may occur on the most exposed sites. Forest openings occur naturally. The river is free flowing with water quality that meets federal and state standards.

**Desired Facility and Human Activities:** This area is managed to provide a Semi-primitive Non-motorized Recreation Opportunity Spectrum (ROS) experience near trails, access points, and other areas of concentrated use. ROS Primitive recreation experiences occur in the more remote areas. Access to the river corridor is limited to a few hiking trails provided primarily to protect natural resources rather than for human comfort or convenience. Visitors are challenged to rely on their physical abilities and encouraged to follow primitive “leave no trace” recreational pursuits. Minimal facilities are provided, primarily to protect natural resources rather than for the comfort or convenience of visitors. As much as possible, facilities such as trailheads and bulletin boards are located outside the river corridor. Hiking, primitive camping, mountain biking, rock climbing, fishing, hunting, canoeing, kayaking, and rafting occur where they do not diminish the area’s Outstandingly Remarkable Values. The Forest Service, on a case-by-case basis, allows temporary use of motorized vehicles and equipment. Recreational off-highway vehicle use off roads is not found in this area. Rarely will evidence of prescribed burning be found.

## Goals and Objectives

**3.C.2-Goal 1.** Maintain and enhance the natural character of the river and its corridor by reducing adverse impacts from private development and use.

**3.C.2-Objective 1.A.** Acquire private lands and mineral rights from willing sellers within the river corridor.

**3.C.2-Objective 1.B.** Make trash clean up a priority using public information and interpretive programs.

**3.C.2-Objective 1.C.** Limit non-recreational special use authorizations to only those necessary for basic public service and Forest Service objectives, where no other reasonable options are available.

**3.C.2-Goal 2.** Protect and enhance the Outstandingly Remarkable Values that qualified this area as a proposed Wild and Scenic River. These are: recreational and aquatic fauna values.

**3.C.2-Objective 2.A.** Protect and maintain significant heritage resources in consultation with the State Historic Preservation Officer and interested federally recognized tribes.

**3.C.2-Objective 2.B.** Maintain the river's free-flowing condition. Ensure that it meets federal and state water quality standards.

**3.C.2-Objective 2.C.** Maintain and enhance the recreational opportunities associated with the river and its corridor.

**3.C.2-Objective 2.D.** Protect the aquatic and riparian habitats that support native species.

**3.C.2-Goal 3.** Manage the river as a primitive, wild area where natural ecological conditions and processes prevail.

**3.C.2-Goal 4.** Provide ROS Semi-primitive Non-motorized recreation experiences near trails, access points, and other areas of concentrated use. ROS Primitive recreation experiences will be the goal in the more remote areas. Minimal facilities, such as trails, are provided primarily to protect natural resources, not for the comfort or convenience of visitors.

## Standards

### MINERALS

**3.C.2-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity. Development of federally owned oil and gas is subject to the No-Surface-Occupancy stipulation.

### ROADS/ENGINEERING

**3.C.2-ENG-1.** Allow no dams or water diversions to be constructed within the river corridor that would substantially alter the river ecosystem or adversely affect aquatic habitat.

### RECREATION

**3.C.2-REC-1.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, and semi-primitive motorized.

### VEGETATION

**3.C.2-VEG-1.** Vegetation management will only occur:

- a) To maintain or protect existing facilities
- b) To protect against fire, insect, disease, non-native species that threaten to negatively impact the area's Outstandingly Remarkable Values
- c) To protect the public.

**3.C.2-VEG-2.** Collection of non-timber forest products is not allowed, except for scientific purposes.

### 3.C.3. RED RIVER NATIONAL WILD AND SCENIC RIVER: RECREATIONAL RIVER SEGMENT

#### Setting

This Prescription Area consists of 1,440 acres along 10.3 miles of the Red River in the Middle Kentucky River Management Area. This river segment is located within the non-wilderness portion of the Red River Gorge Geological Area. This area is classified as a Wild and Scenic River under P.L. 95-625.

This Prescription Area is Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

#### Desired Future Condition

**Emphasis of Condition:** Natural ecological processes and conditions to dominate, but some human influence exists. The Outstandingly Remarkable Values that allowed this to be designated as a National Wild and Scenic River segment are protected and enhanced.

**Desired Ecosystem Condition:** This segment of the river and its corridor provide for a natural appearing forest interspersed with cliffhines. On flood plains, forests are dominated by species such as sycamore, river birch, green ash, boxelder, and occasionally American beech, yellow-poplar, eastern hemlock, and white oak. Lower slopes, and mid to upper slopes with north or east aspect, are dominated by mixed mesophytic forest composed of yellow-poplar, American beech, yellow buckeye, white ash, eastern hemlock, sugar maple, with various oaks, hickories and occasional species such as butternut, black walnut, black birch, American basswood, and white pine. Mid to upper slopes with south or west aspect are dominated by oaks with scattered occurrences of species associated with mixed mesophytic forests. Oaks, and sometimes yellow pines and American chestnut, occur on ridges and the most exposed sites. Openings in the forest canopy occur as the result of natural processes as well as management activities.

The river is free flowing with water quality that meets federal and state standards.

**Desired Facility and Human Activities:** The area is managed primarily to provide Semi-primitive Motorized and Roded Natural Recreation Opportunity Spectrum (ROS) experiences while protecting the area's unique heritage resources and biological species. However, at the Gladie Cultural-Environmental Learning Center site a more Rural ROS is maintained. Dispersed recreation in addition to environmental and heritage education are major emphases for this area. Several trails, trailheads, and a few roads are managed to provide access. Among large expanses of forested area, some facilities, such as picnic areas, vistas, and primitive campsites, are provided for the comfort and convenience of visitors. Some developments, such as small ponds and openings, enhance wildlife habitat. In places, ample opportunities to interact with others exist. For most of the area, however, there are opportunities for solitude. Limited reliance on personal physical abilities and primitive skills are required except for activities such as rock climbing, rappelling, and backpacking. Most types of outdoor recreation activities and wildlife enhancements occur where negative impacts to natural resources and forest visitors can be mitigated or controlled through regulation, facility

design and operation, or other management. Recreational off-highway vehicle use and special uses not in keeping with the Desired Future Condition do not occur in this area.

Occasionally, management activities include the use of motorized equipment to construct or maintain roads and trails. Vegetation may be occasionally manipulated to maintain the conditions that are consistent with the designation. Trees damaged or knocked down following unforeseen events such as wildland fire, wind, snow, and insect and disease outbreaks might be removed for public safety or to facilitate restoration toward the conditions that are consistent with the designation. Tree felling and removal using motorized equipment could occur. Fire suppression activities could include the use of heavy equipment to construct firelines, while aircraft may provide detection and suppression support.

## Goals and Objectives

**3.C.3-Goal 1.** Maintain and enhance the natural character of the river and its corridor by reducing adverse impacts from private development and use.

**3.C.3-Objective 1.A.** Acquire private lands and mineral rights from willing sellers within the river corridor.

**3.C.3-Objective 1.B.** Make trash clean up a priority using public information and interpretive programs.

**3.C.3-Objective 1.C.** Limit non-recreational special use authorizations to only those necessary for basic public service and Forest Service objectives, where no other reasonable options are available.

**3.C.3-Goal 2.** Protect and enhance the Outstandingly Remarkable Values that qualified this stream as a Wild and Scenic River. These are: scenic, recreational, geological, heritage, aquatic and botanical values.

**3.C.3-Objective 2.A.** Protect and maintain significant heritage resources in consultation with the State Historic Preservation Officer and interested federally recognized tribes.

**3.C.3-Objective 2.B.** Maintain the river's free-flowing condition. Ensure that it meets federal and state water quality standards.

**3.C.3-Objective 2.C.** Maintain and enhance the recreational opportunities associated with the river and its corridor.

**3.C.3-Objective 2.D.** Coordinate with the Kentucky Natural Resources and Environmental Protection Cabinet on management of this Kentucky Wild River in accordance with current or future agreements.

**3.C.3-Objective 2.E.** Protect the aquatic and riparian habitats that support native species.

**3.C.3-Objective 2.F.** Complete the Limits of Acceptable Change process with public input.

**3.C.3-Goal 3.** Provide for ROS Semi-primitive Motorized or Roaded natural recreational experiences. Maintain a more Rural ROS experience at the Gladie Cultural-Environmental Learning Center site.

**3.C.3-Objective 3.A.** Provide and maintain access to the river and its corridor.

**3.C.3-Goal 4.** Maintain and enhance the recreational opportunities associated with the area, particularly dispersed recreational activities such as fishing, canoeing, kayaking, scenic viewing, hiking, camping, backpacking, and rock climbing.

## Standards

### MINERALS

**3.C.3-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity. Development of federally owned oil and gas is subject to the no surface occupancy stipulation.

### ROADS/ENGINEERING

**3.C.3-ENG-1.** Any water resources project will be evaluated under the appropriate standard of Section 7 of the Wild and Scenic Rivers Act.

### RECREATION

**3.C.3-REC-1.** Take action to protect qualifying heritage sites if they are adversely impacted, or will probably be adversely impacted, by human use.

**3.C.3-REC-2.** Prohibit campfires and camping within 100 feet of the base of clifflines or the back of rockshelters unless at a designated site.

**3.C.3-REC-3.** Allow no horses or other livestock within this area except on trails designated for such use or as specifically authorized.

**3.C.3-REC-4.** No trails will be designated for off-highway vehicle use.

**3.C.3-REC-5.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, roaded natural and rural.

### VEGETATION

**3.C.3-VEG-1.** Vegetation management will only occur:

- a) To maintain or protect existing facilities or for the construction of new facilities
- b) To protect against fire, insect, disease, non-native species that threaten to negatively impact the area's Outstandingly Remarkable Values
- c) When needed to protect or restore the natural ecosystem of the area
- d) To protect the public
- e) To provide for fish and wildlife habitat
- f) To provide for viewing of a point of interest
- g) For interpretation of heritage and natural resources.

### 3.C.4. PROPOSED WILD AND SCENIC RIVERS: CUMBERLAND RIVER SEGMENT, WAR FORK CREEK SEGMENT, ROCKCASTLE RIVER SEGMENT - SCENIC RIVERS

#### Setting

This Prescription Area contains 35.3 miles of river and approximately 5,600 acres of corridors. It is located in the Cumberland River Management Area, except for War Fork Creek, which is in the Middle Kentucky River Management Area. These river segments have been proposed by the Forest as suitable for Federal designation as Wild and Scenic Rivers. Final action on this designation is pending. The Cumberland and Rockcastle River segments are designated as Kentucky Wild Rivers by the state.

This Prescription Area is Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

#### Desired Future Condition

**Emphasis of Condition:** Natural ecological processes and conditions dominate, but some human influence exists. The free flowing condition, water quality, and Outstandingly Remarkable Values that qualified these stream segments as a National Wild and Scenic River are protected and enhanced.

**Desired Ecosystem Condition:** These river segments and their corridors provide for a natural appearing forest. On flood plains, forests are dominated by species such as sycamore, river birch, green ash, boxelder, and occasionally American beech, yellow-poplar, eastern hemlock, and white oak. Lower slopes, and mid to upper slopes with north or east aspect, are dominated by mixed mesophytic forest composed of yellow-poplar, American beech, yellow buckeye, white ash, eastern hemlock, sugar maple, with various oaks, hickories and occasional species such as butternut, black walnut, black birch, American basswood, and white pine. Mid to upper slopes with south or west aspect are dominated by oaks with scattered occurrences of species associated with mixed mesophytic forests. Oaks, and sometimes yellow pines and American chestnut, occur on ridges and the most exposed sites. Openings in the forest canopy occur as the result of natural processes as well as management activities.

**Desired Facility and Human Activities:** These areas are primarily managed to provide for Semi-primitive Motorized or Roaded Natural Recreation Opportunity Spectrum (ROS) experiences. However, some private lands may have a more Rural Experiences. A few trail and road segments are managed to provide access to the river and its corridor. Between long stretches of undeveloped forest areas there are a few facilities provided for the comfort and convenience of visitors in addition to developments that enhance wildlife and fisheries habitat. Occasional opportunities to interact with others exist. Limited reliance on personal physical abilities and primitive skills may be required except for activities such as boating during high water flows. Recreational off-highway vehicle use and special uses not in keeping with the Desired Future Condition do not occur in these areas. Most types of outdoor recreation activities and wildlife enhancements are appropriate if negative impacts to scenic values, natural resources or forest visitors can be mitigated or controlled through regulation or facility design and operation.



Occasionally, management activities include the use of motorized equipment to construct or maintain roads and trails. Vegetation may be occasionally manipulated to maintain the conditions that are consistent with the proposed designation. Trees damaged or knocked down following unforeseen events such as wildland fire, wind, snow, and insect and disease outbreaks might be removed for public safety or to facilitate restoration toward the conditions that are consistent with the proposed designation. Tree felling and removal using motorized equipment could occur. Fire suppression activities could include the use of heavy equipment to construct firelines, while aircraft may provide detection and suppression support.

## Goals and Objectives

**3.C.4-Goal 1.** Maintain and enhance the natural character of these rivers and their corridors by reducing adverse impacts from private development and use.

**3.C.4-Objective 1.A.** Acquire private lands and mineral rights from willing sellers within these river corridors.

**3.C.4-Objective 1.B.** Make trash clean up a priority using public information and interpretive programs.

**3.C.4-Objective 1.C.** Limit non-recreational special use authorizations to only those necessary for basic public service and Forest Service objectives, where no other reasonable options are available.

**3.C.4-Goal 2.** Protect and enhance the Outstandingly Remarkable Values that qualified these as Wild and Scenic Rivers. These are: scenic, recreational, geological, and heritage values.

**3.C.4-Objective 2.A.** Protect and maintain significant heritage resources, in consultation with the State Historic Preservation Officer and interested federally recognized tribes.

**3.C.4-Objective 2.B.** Maintain and enhance the recreational opportunities associated with these rivers and their corridors.

**3.C.4-Objective 2.C.** Maintain the free-flowing condition of these study-river segments. Ensure they meet state and federal water quality standards.

**3.C.4-Objective 2.D.** Coordinate with the Kentucky Natural Resources and Environmental Protection Cabinet on management of these Kentucky Wild Rivers in accordance with current or future agreements.

**3.C.4-Objective 2.E.** Protect the aquatic and riparian habitats that support native species.

**3.C.4-Objective 2.F.** Maintain a diversity of forest types in the corridor.

**3.C.4-Goal 3.** Provide for semi-primitive motorized or roaded natural ROS.

**3.C.4-Objective 3.A.** Provide access to these rivers.

**3.C.4-Goal 4.** Maintain and enhance the recreational opportunities associated with the area, particularly dispersed recreational activities such as fishing, canoeing, kayaking, scenic viewing, hiking, camping and backpacking.

## Standards

### MINERALS

**3.C.4-MIN-1.** Development of federally owned oil and gas is subject to the controlled surface use stipulation. All other federal mineral activity will be implemented in accordance with the Desired Future Condition and standards of this prescription area.

### ROADS/ENGINEERING

**3.C.4-ENG-1.** Allow no dams or water diversions to be constructed on these river segments that would substantially alter the river ecosystem or adversely affect aquatic habitat.

**3.C.4-ENG-2.** Evaluations of projects on, directly affecting, or invading the corridors or diminishing the Outstandingly Remarkable Values of these river segments should adhere to the guidance of the Interagency Wild and Scenic Rivers Coordinating Council.

### RECREATION

**3.C.4-REC-1.** Conduct archeological surveys of areas adversely impacted by human use. Take action to protect qualifying heritage sites if they are impacted, or will probably be impacted, by such use.

**3.C.4-REC-2.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, and roaded natural.

### VEGETATION

**3.C.4-VEG-1.** Vegetation management will only occur:

- a) To maintain or protect existing facilities or for the construction of new facilities
- b) To protect against wildland fire, insect and disease outbreaks, or invasive species and disturbance events that threaten to negatively impact the area's Outstandingly Remarkable Values
- c) When needed to protect or restore the natural ecosystem of the area
- d) To protect the public
- e) To provide for fish and wildlife habitat
- f) To provide for viewing of a point of interest
- g) For interpretation of heritage and natural resources.

### 3.C.5. PROPOSED WILD AND SCENIC RIVERS: ROCK CREEK SEGMENT AND MARSH CREEK SEGMENT - RECREATIONAL RIVERS

#### Setting

This Prescription Area contains 25.5 miles of river and approximately 6,180 acres of corridors. It is located in the Cumberland River Management Area. These river segments have been proposed by the Forest as suitable for Federal designation as Wild and Scenic Rivers. Final action on this designation is pending. The Commonwealth of Kentucky also designates Rock Creek as a Kentucky Wild River.

This Prescription Area is Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

#### Desired Future Condition

**Emphasis of Condition:** Natural ecological processes and conditions dominate. However, some human influence may be evident. The free flowing condition, water quality, and Outstandingly Remarkable Values that qualified these stream segments as a National Wild and Scenic River are protected and enhanced.

**Desired Ecosystem Condition:** These river segments and their corridors provide for a natural appearing forest. On flood plains, forests are dominated by species such as sycamore, river birch, green ash, boxelder, and occasionally American beech, yellow-poplar, eastern hemlock, and white oak. Lower slopes, and mid to upper slopes with north or east aspect, are dominated by mixed mesophytic forest composed of yellow-poplar, American beech, yellow buckeye, white ash, eastern hemlock, sugar maple, with various oaks, hickories and occasional species such as butternut, black walnut, black birch, American basswood, and white pine. Mid to upper slopes with south or west aspect are dominated by oaks. Oaks, and frequently yellow pines and American chestnut, occur on ridges and the most exposed sites. Openings in the forest canopy occur as the result of natural processes as well as management activities.

**Desired Facility and Human Activities:** These river segments are managed primarily to provide Semi-primitive Motorized or Roaded natural Recreation Opportunity Spectrum (ROS) experiences. However, some private lands will provide a more Rural ROS experience. Trail and road segments are managed to provide access to these segments and their corridors. Between stretches of undeveloped forest areas there may be a few facilities provided for the comfort and convenience of visitors in addition to developments that enhance wildlife and fisheries habitat. Opportunities to interact with others exist. Limited reliance on personal physical abilities and primitive skills will be required except for activities such as boating during high water flows. Recreational off-highway vehicle use and special uses not in keeping with the Desired Future Condition do not occur in these areas. Most types of outdoor recreation activities and wildlife enhancements are appropriate where negative impacts to scenic values, natural resources, or forest visitors can be mitigated or controlled through regulation or facility design and operation.

Occasionally, management activities include the use of motorized equipment to construct or maintain roads and trails. Vegetation may be occasionally manipulated to maintain the conditions

that are consistent with the proposed designation. Trees damaged or knocked down following unforeseen events such as wildland fire, wind, snow, and insect and disease outbreaks might be removed for public safety or to facilitate restoration toward the conditions that are consistent with the proposed designation. Tree felling and removal using motorized equipment could occur. Fire suppression activities could include the use of heavy equipment to construct firelines, while aircraft may provide detection and suppression support.

## Goals and Objectives

**3.C.5-Goal 1.** Maintain and enhance the natural character of these rivers and their corridors by reducing adverse impacts from private development and use.

**3.C.5-Objective 1.A.** Acquire private lands and mineral rights from willing sellers within these river corridors.

**3.C.5-Objective 1.B.** Make trash clean up a priority using public information and interpretive programs.

**3.C.5-Objective 1.C.** Limit non-recreational special use authorizations to only those necessary for basic public service and Forest Service objectives, where no other reasonable options are available.

**3.C.5-Goal 2.** Protect and enhance the Outstandingly Remarkable Values that qualified these streams as Wild and Scenic Rivers. These are: recreational, aquatic fauna, and water quality values.

**3.C.5-Objective 2.A.** Maintain the free-flowing condition of these study-river segments. Ensure they meet federal and state water quality standards.

**3.C.5-Objective 2.B.** Maintain and enhance the recreational opportunities associated with these rivers and their corridors.

**3.C.5-Objective 2.C.** Coordinate with the Kentucky Natural Resources and Environmental Protection Cabinet (KNREPC) on management of Rock Creek as a Kentucky Wild River in accordance with current or future agreements.

**3.C.5-Objective 2.D.** Protect aquatic and riparian habitats that support native species.

**3.C.5-Objective 2.E.** Maintain a diversity of forest types in the corridor.

**3.C.5-Goal 3.** Provide for semi-primitive motorized or roaded natural Recreation Opportunity Spectrum (ROS) experience. However, on some private land a more Rural ROS will exist.

**3.C.5-Objective 3.A.** Provide access to these rivers.

**3.C.5-Goal 4.** Maintain and enhance the recreational opportunities associated with the area, particularly dispersed recreational activities such as fishing, canoeing, kayaking, scenic viewing, hiking, camping and backpacking.

## Standards

### MINERALS

**3.C.5-MIN-1.** Development of federally owned oil and gas is subject to the controlled surface use stipulation. All other federal mineral activity will be implemented in accordance with the Desired Future Condition and standards of this prescription area.

### RECREATION

**3.C.5-REC-1.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, and roaded natural.

### VEGETATION

**3.C.5-VEG-1.** Vegetation management will only occur:

- a) To maintain or protect existing facilities or for the construction of new facilities
- b) To protect against wildland fire, insect and disease outbreaks, or invasive species that threaten to negatively impact the area's Outstandingly Remarkable Values
- c) When needed to protect or restore the natural ecosystem of the area
- d) To protect the public
- e) To provide for fish and wildlife habitat
- f) To provide for viewing of a point of interest
- g) For interpretation of heritage and natural resources.

### 3.E. RED RIVER GORGE GEOLOGICAL AREA

#### Setting

This Prescription Area includes all of Red River Gorge Geological Area outside the Clifty Wilderness. However, it does include the Red River Wild and Scenic River Recreational Segment. It consists of 16,042 acres in the Middle Kentucky River Management Area. This is part of the Geological Area as classified under the authority of 36 CFR 294.1.

This Prescription Area is Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

#### Desired Future Condition

**Emphasis of Condition:** Natural ecological processes and conditions dominate, but some human influence, primarily dispersed outdoor recreation, commonly occurs. The outstanding resource values that contributed to this area's designation as part of a Geological Area and National Natural Landmark are protected and enhanced. Attributes that qualified this area as part of the National Historic Landmark and a National Historic District are protected.

**Desired Ecosystem Condition:** This area provides a natural appearing, mid- to late-successional, old-aged forest environment interspersed with clifflines and rock arches. Lower slopes, and mid to upper slopes with north or east aspect, are dominated by mixed mesophytic forest composed of yellow-poplar, American beech, yellow buckeye, white ash, eastern hemlock, sugar maple, with various oaks, hickories and occasional species such as butternut, black walnut, black birch, American basswood, and white pine. Mid to upper slopes with south or west aspect are dominated by oaks. Oaks, and frequently yellow pines and American chestnut, particularly pitch pine, occur on ridges and the most exposed sites. Openings in the forest canopy occur as the result of natural processes as well as management activities.

**Desired Facility and Human Activities:** The area is managed primarily to provide Semi-primitive Motorized and Roaded Natural Recreation Opportunity Spectrum (ROS) experiences while protecting the area's unique heritage resources and biological species. However, at the Gladie Cultural-Environmental Learning Center site, Sky Bridge area, and Koomer Ridge Campground, a more Rural ROS is maintained. Dispersed recreation in addition to environmental and heritage education are major emphases for this area. Several trails, trailheads, and a few roads are managed to provide access. Among large expanses of forested area, some facilities, such as picnic areas, vistas, and primitive campsites, are provided for the comfort and convenience of visitors. Some developments, such as small ponds and openings, enhance wildlife habitat. In places, ample opportunities to interact with others exist. For most of the area, however, there are opportunities for solitude. Limited reliance on personal physical abilities and primitive skills are required except for activities such as rock climbing, rappelling, and backpacking. Most types of outdoor recreation activities and wildlife enhancements occur where negative impacts to natural resources and forest visitors can be mitigated or controlled through regulation, facility design and operation, or other management. Recreational off-highway vehicle use does not occur in this area.

Management activities include the use of motorized equipment to construct or maintain roads and trails. Vegetation may be manipulated to maintain conditions consistent with Goals and Objectives. Trees damaged or knocked down following unforeseen events such as wildland fire, wind, snow, and insect and disease outbreaks might be removed for public safety or to facilitate restoration toward the conditions that are consistent with Goals and Objectives. Tree felling and removal using motorized equipment could occur. Fire suppression activities could include the use of heavy equipment to construct firelines, while aircraft may provide detection and suppression support.

## Goals and Objectives

### **3.E-Goal 1.** Maintain and enhance the natural character of the area.

**3.E-Objective 1.A.** Acquire private lands and mineral rights within the area from willing sellers.

**3.E-Objective 1.B.** Make trash clean up a priority using public information and interpretive programs.

**3.E-Objective 1.C.** Limit non-recreational special use authorizations to only those necessary for basic public service and Forest Service objectives, where no other reasonable options are available.

### **3.E-Goal 2.** Maintain and enhance the recreational opportunities associated with the area, particularly dispersed recreational activities such as scenic viewing, hiking, camping, backpacking, and rock climbing.

### **3.E-Goal 3.** Protect the values that qualified this area as part of a Geological Area and a National Natural Landmark.

**3.E-Objective 3.A.** Through the Limits of Acceptable Change process, manage recreation use to mitigate unacceptable resource damage and crowding that can result from heavy recreational use.

### **3.E-Goal 4.** Preserve significant heritage resources in consultation with the State Historic Preservation Officer and interested federally recognized tribes.

**3.E-Objective 4.A.** Nominate the area for listing on the National Register of Historic Places as an Archeological District. Pursue nomination as a National Historic Landmark.

**3.E-Objective 4.B.** Complete a Heritage management Plan to identify appropriate uses and treatment for heritage resources.

### **3.E-Goal 5.** Protect and enhance the unique biological species in this area.

**3.E-Objective 5.A.** Maintains a diversity of forest types through direct management.

### **3.E-Goal 6.** Cultivate the public's appreciation of this area's natural and heritage resources and ecological processes through environmental education and interpretation.

### **3.E-Goal 7.** Manage this area to primarily provide for non-motorized dispersed recreational activities in Semi-primitive Motorized and Roaded Natural ROS experiences.

**3.E-Objective 7.A.** Retain the roadless characteristics of the Wolfpen Inventoried Roadless Area located between Clifty Wilderness and State Route 77.

## Standards

### MINERALS

- 3.E-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity; development of federally owned oil and gas is subject to the no surface occupancy stipulation.

### RECREATION

- 3.E-REC-1.** Camping is not permitted within 100 feet of the base of any cliff, or the back of any rockshelter unless the Forest Service designates a site.
- 3.E-REC-2.** Prohibit building, maintaining, attending, or using a fire, campfire, or stove fire within 100 feet of the base of a cliff, or the back of any rockshelter, unless a site is designated by the Forest Service.
- 3.E-REC-3.** Allow no horses or other livestock in this area except on designated trails or as specifically permitted.
- 3.E-REC-4.** No trails will be designated for off-highway vehicle use.
- 3.E-REC-5.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experienceness of semi-primitive non-motorized, semi-primitive motorized, and roaded natural.

### VEGETATION

- 3.E-VEG-1.** Vegetation management will only occur:
- a) To maintain or protect existing facilities or for the construction of new facilities
  - b) To protect against wildland fire, insect and disease outbreaks, or invasive species that threaten to negatively impact the area's resource values
  - c) When needed to protect or restore the natural ecosystem of the area
  - d) To protect the public
  - e) To provide for fish and wildlife habitat
  - f) To provide for viewing of a point of interest
  - g) For interpretation of heritage and natural resources.

### PRESCRIBED FIRE

- 3.E-FIRE-1.** Prior to igniting prescribed fires, conduct a cursory survey within burn units and adjacent cliffclines for heritage resources and protect these resources during the burn.



### 3.F. NATURAL ARCH SCENIC AREA

#### Setting

This Prescription Area contains approximately 1,065 acres and is located in the Cumberland River Management Area. The Secretary of Agriculture under Regulation U-3 designated this area.

This Prescription Area is Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions.

#### Desired Future Condition

**Emphasis of Condition:** Natural ecological processes and conditions dominate, but some human influence, primarily dispersed recreation, commonly occurs. The public's appreciation of these unique scenic features and the natural setting is cultivated. Unique geological features including rock arches, rock bridges, rockshelters, and "rockhouses" are common in this area.

**Desired Ecosystem Conditions:** This area provides a natural appearing, mid- to late-successional, old-aged forest environment interspersed with unique geological formations. Lower slopes, and mid to upper slopes with north or east aspect, are dominated by mixed mesophytic forest composed of yellow-poplar, American beech, yellow buckeye, white ash, eastern hemlock, sugar maple, with various oaks, hickories and occasional species such as butternut, black walnut, black birch, American basswood, and white pine. Mid to upper slopes with south or west aspect are dominated by oaks. Oaks, and frequently yellow pines and American chestnut, occur on ridges and the most exposed sites. Openings in the forest canopy occur as the result of natural processes as well as management activities.

**Desired Facilities and Human Activities:** The area is managed primarily to provide Semi-primitive Motorized and Roaded Natural Recreation Opportunity Spectrum (ROS) experiences while protecting the area's unique heritage resources and biological species. However, at developed recreation areas, a more Rural ROS is maintained. Dispersed recreation in addition to environmental and heritage education are a major emphasis for this area. Trails and trailheads are managed to provide access. Some developments, such as small ponds and openings, enhance wildlife habitat. In places, ample opportunities to interact with others exist. For most of the area, however, there are opportunities for solitude. Limited reliance on personal physical abilities and primitive skills are required except for activities such as backpacking. Outdoor recreation activities and wildlife enhancements occur and are compatible with other resource values. Recreational off-highway vehicle use and special uses not in keeping with the Desired Future Condition do not occur in this area.

Occasionally, management activities include the use of motorized equipment to construct or maintain roads and trails. Vegetation may be occasionally manipulated to maintain the conditions that are consistent with the designation. Prescribed fire may be used to restore and maintain the yellow pine forests and rare species in the area, and maintain the upland oak forests in the area. Trees damaged or knocked down following unforeseen events such as wildland fire, wind, snow, and insect and disease outbreaks might be removed for public safety or to facilitate restoration toward the conditions that are consistent with the designation. Tree felling and removal using motorized

equipment could occur. Fire suppression activities could include the use of heavy equipment to construct firelines, while aircraft may provide detection and suppression support.

## Goals and Objectives

**3.F-Goal 1.** Maintain and enhance the natural character of the area by reducing adverse impacts from private development and use.

**3.F-Objective 1.A.** Acquire private lands and mineral rights within the area from willing sellers.

**3.F-Objective 1.B.** Make trash clean up a priority using public information and interpretive programs.

**3.F-Objective 1.C.** Limit special use authorizations to only those necessary for basic service to the general public and Forest Service objectives, where no other reasonable options are available.

**3.F-Goal 2.** Protect the values that qualified this area as a Scenic Area.

**3.F-Goal 3.** Maintain and enhance recreational opportunities associated with the area, particularly dispersed activities such as scenic viewing and hiking.

**3.F-Goal 4.** Provide a natural appearing, mid- to late-successional, old-aged forest environment interspersed with vistas of clifflines and rock arches.

**3.F-Goal 5.** Provide primarily non-motorized dispersed recreational activities in Semi-primitive Motorized and Roaded Natural ROS experiences.

**3.F-Goal 6.** Use environmental education and interpretation to cultivate the public's appreciation of the area's natural and heritage resources and ecological processes.

**3.F-Objective 6.A.** Protect Indian sacred sites.

**3.F-Goal 7.** Protect and enhance the unique biological species in this area.

**3.F-Objective 7.A.** Maintain a diversity of forest types in the area.

**3.F-Objective 7.B.** Maintain the historic American chaffseed location in habitat suitable for the species using appropriate means.

## Standards

### MINERALS

**3.F-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity. Development of federally owned oil and gas is subject to the no surface occupancy stipulation.

**3.F-MIN-2.** Removal of common-variety minerals is prohibited.

### RECREATION

**3.F-REC-1.** No trails will be designated for off-highway vehicle use.

**3.F-REC-2.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, and roaded natural.

### VEGETATION

**3.F-VEG-1.** Vegetation management will only occur:

- a) To maintain or protect existing facilities or for the construction of new facilities
- b) To protect against wildland fire, insect and disease outbreaks, or invasive species that threaten to negatively impact the area's resource values
- c) When needed to protect or restore the natural ecosystem of the area
- d) To protect the public
- e) To provide for fish and wildlife habitat
- f) To provide for viewing of a point of interest
- g) For interpretation of heritage and natural resources.

**3.F-VEG-2.** Collection of non-timber forest products is not allowed, except for scientific purposes.

### 3.H.1. RUFFED GROUSE EMPHASIS

#### Setting

This Prescription Area consists of one location in the Cumberland River Management Area and another in the Licking River Management Area totaling 10,500 acres.

This Prescription Area is Suitable for Timber Production (Scheduled Harvest) – Non-timber emphasis.

#### Desired Future Condition

**Emphasis of Condition:** These areas are managed to favor species that use young-age forest conditions with an emphasis on providing high-quality ruffed grouse habitat. They are cooperatively managed with the Kentucky Department of Fish and Wildlife Resources (KDFWR) to provide sport hunting and viewing opportunities.

**Desired Ecosystem Conditions:** Ruffed Grouse Emphasis areas represent an early-aged forest mosaic within the larger mature forest landscape. Species associated with seedling/sapling forest habitat flourish and contribute to overall landscape diversity. Previously declining populations of bird species dependant on, or associated with, these habitat types, such as the prairie warbler, American woodcock, yellow-breasted chat, common yellowthroat, and orchard oriole are now increasing along with the ruffed grouse population. A combination of vegetation manipulation and prescribed fire result in a forest dominated by tree species that are intolerant to heavy shade. Management activities and occasional natural disturbances create canopy openings, generally around 20 acres in size. Temporary openings, the result of re-vegetation and stabilization of log landings and temporary roads, may be found.

**Desired Facilities and Human Activities:** Cooperative management focuses on sport hunting and bird watching. The KDFWR is primarily responsible for management of game populations, while the Forest Service is primarily responsible for habitat management. The KDFWR may structure hunting regulations to address area-specific considerations to achieve mutual goals. Roads and trails are scattered throughout the area. Some roads may be closed seasonally to protect resource values. Silvicultural and habitat treatments routinely occur, many of which result in the sale of forest products. Evidence of prescribed fire occurs in many areas. Foot travel is encouraged, and there are extensive opportunities to access seedling/sapling stands. Grouse “drumming” is often heard. Motorized vehicles are restricted to developed roads. Hiking, biking, and horse trails may be present throughout the area. Visitors find themselves in a highly diverse forest landscape with a variety of wildlife viewing opportunities. Sights and sounds of other people and vehicles may occasionally be present. Federal minerals may be developed under standard lease terms.

## Goals and Objectives

**3.H.1-Goal 1.** Develop appropriate early-aged forest conditions to improve structural diversity and sustain an abundance of ruffed grouse and associated species.

**3.H.1-Objective 1.A.** Establish and maintain a high-canopy overstory matrix with approximately 8 percent in the 0-5 year age class (a 60-year rotation).

**3.H.1-Objective 1.B.** Develop dense hardwood-dominated seedling/sapling stands greater than 5 acres in size, preferable around 15 – 20 acres, with 20,000 or more stems per acre, using even-aged silvicultural systems.

**3.H.1-Objective 1.C.** Develop habitat sufficient to sustain a grouse population of up to 30 birds per 640 acres.

**3.H.1-Objective 1.D.** Identify and develop a similar suitable unit for ruffed grouse management emphasis within the Upper Kentucky River Management Area.

## Standards

### RECREATION

**3.H.1-REC-1.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of roaded natural and roaded modified.

### WILDLIFE

**3.H.1-WLF-1.** Drumming logs must be retained within regenerated stands, at upper slope positions, and aligned parallel to the slope.

**3.H.1-WLF-2.** Where grapevine control measures are necessary to develop and sustain suitable forest conditions, retain 1-2 acre grape arbors at a density of at least two per 160 acres.

## 4.A. TIMBER PRODUCTION EMPHASIS AREA

### Setting

Unless allocated to another Prescription Area, National Forest System land is allocated to the Timber Production Prescription Area. It may consist of small to large parcels that may be adjacent to, or possibly surrounded by, other Prescription Areas.

This Prescription Area is currently estimated at approximately 396,700 acres (including overlapping prescription areas) across the DBNF.

Approximately 368,500 acres of forest and woodland in this prescription area are classified as Suitable for Timber Production (Scheduled Harvest) – Timber emphasis. All potential wooded grassland/shrubland (approximately 1145 acres); and those areas identified as Economically Unsuitable (approximately 7081 acres) are classified as Unsuitable for Timber Production – tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain desired future conditions.

### Desired Future Condition

**Emphasis of Condition:** This area is managed for the sustained production of high-value sawtimber. A profitable harvest of timber products takes place on a regular schedule. Timber stands improvement and regeneration harvest methods that support optimal growth and yield of high-quality sawtimber are applied to sites that are most productive of oak and other valuable hardwoods.

**Desired Ecosystem Conditions:** Forest communities range from early through mid-successional, with canopies containing mostly shade-intolerant to mid-tolerant tree species. Shade-tolerant understory species rarely become dominant in the canopy at the time of the final regeneration harvest. Two-aged and occasional even-aged forests, in various stages of development, characterize the area. Stands range from recently harvested units just beginning to regenerate to economically mature, well-stocked stands with large, high-quality trees. Young stands range in size from 10 - 40 acres, although some salvage regeneration areas may be larger. Early successional habitat conditions are scattered and become available in changing locations as a result and of timber harvesting across the landscape.

Part of the area is classified as unsuitable for timber production due to economic factors<sup>21</sup>. On sites where long-term costs of harvest/reforestation greatly exceed timber value, silvicultural activity seldom occurs, and such sites may develop old-growth characteristics. However, timber suitability classification may change as economic factors change. Economically “marginal” stands may be reclassified as suitable for timber production if markets improve. Stands currently inaccessible could be reclassified if ownership patterns change or rights-of-way become available.

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<sup>21</sup> Stands classified as MIN Level where costs exceed product values. Such stands may have steep slopes or physical barriers, low value products, excessive road costs, or be an isolated tract with limited access.

Habitat associations present at various levels as a result of timber management include:

- a) Early successional grass/forb associates
- b) Early successional shrub/seedling/sapling associates
- c) Mid-age upland and cove forest associates
- d) Mature upland and cove forest associates.

Populations of ruffed grouse, white-tailed deer, and eastern wild turkey are maintained. Management and protection is provided for rare communities and species associates, along with management and protection measures for occurrences of TES and locally rare species. Such species continue to persist on Forest lands.

**Desired Facilities and Human Activities:** A network of system roads provides access to as much of this area as practical. Roads are maintained to provide access for Forest visitors and administrative use. Temporary roads, constructed to access harvest units, are closed and revegetated after fulfilling their purpose. Logging and other cost-effective silvicultural treatments occur. Pulpwood, fuel wood, and low-value sawtimber are occasionally harvested along with high-value sawtimber and as a by-product of timber stand improvement. Hunting and other dispersed recreation, such as OHV riding, mountain biking, horseback riding, and berry picking commonly occur. In highly used portions of this area, visitors find attractive interpretative signs that explain the management goals for the area.

### Goals and Objectives:

**4.A-Goal 1.** Provide a non-declining, sustained yield of timber products.

**4.A-Objective 1.A.** Maintain at least the current average of sawtimber growing stock on suitable timberland of at least 9 CCF/acre (5.4 MBF/acre) within this area over the decade; or, maintain an average net annual change of sawtimber on suitable timberland at  $\geq 0$  within this area over the decade.

**4.A-Objective 1.B.** Work towards a balanced age-class distribution by regenerating only from 10-year age-classes that contain  $>8$  percent of the suitable timberland within the prescription area at the time of project planning.

**4.A-Objective 1.C.** Reforest all non-stocked and inadequately stocked forest (not managed woodland or wooded grassland/shrubland) within the planning period.

**4.A-Objective 1.D.** Release all planted trees as needed (typically 1<sup>st</sup> and 3<sup>rd</sup> growing season).

**4.A-Objective 1.E.** Maintain forest pest host conditions at low hazard. Conduct aggressive suppression of both non-native and native pests using all available tools including species conversions to match species to sites.

**4.A-Goal 1.** Grow trees to provide quality sawtimber at final harvest.

**4.A-Objective 2.A.** Promote the development of tree Grades 1 and 2 during thinning operations (1985 LRMP, pg. IV-58, mod).

**4.A-Objective 2.B.** Develop overstories containing at least a 50 percent component of high-value appraisal species<sup>22</sup> on suitable sites during silviculture operations. The remainder should consist of mid-value species (including southern yellow pine and other conifers).

<sup>22</sup> NRO: 812,833,837; WHO: 802, 832(grade 1&2); WAL; CHY; Mid-value = all other grade 3+ native.

**4.A-Goal 1.** Optimize the area's potential for volume timber production.

**4.A-Objective 3.A.** Thin 15,000 acres per decade to maintain stands below the "overstocked" level.

**4.A-Objective 2.B.** Harvest suitable stands no earlier than at the culmination of mean annual increment<sup>23</sup>, now estimated to average about 100 years, in all community types. This translates to an annual (even-aged) harvest of about one percent of suitable forest in this prescription area.

Rotations and Entry Periods should approximate the following:

Forest Type	Even-age	Two-age	Uneven-age
Yellow pine, yellow pine –hardwood, cove-northern hardwood	90	80 and 160	Target Basal Area diameter with q factor (BDQ)=70/24/1.6 for Single or Group. Enter when merchantable.
Mixed mesophytic, oak-yellow pine	100	90 and 180	
Upland Oak	110	100 and 200	

## Standards

### RECREATION:

**4.A-REC-1.** Trails -- OHV, horse, and foot -- will occasionally be rerouted to reduce maintenance costs, e.g., where grass/shrub/sapling growth is rapid, or for more pleasing visual perspectives.

### WILDLIFE MANAGEMENT:

**4.A-WLF-1.** Small inclusions of rare communities will be managed, maintained, or enhanced, unless this activity conflicts with objectives; if conflicts occur, minimum legal requirements will at least be met.

### VEGETATION MANAGEMENT:

**4.A-VEG-1.** The majority of this area is classified as Suitable for scheduled timber production – Standard – Normal timber production. Those lands having timberland economically unsuited for timber production will be identified on a site-specific basis. Land classification will be updated if factors change significantly. When such changes cause a variance in suitable acres of more than 10 percent from 2002 estimates, an amendment must be made to the Forest Plan. Year 2002 estimates of land suitable for timber production within this prescription area is: 349,648 acres.

<sup>23</sup> Based on projections using the Forest Vegetation Simulator, Central States Variant (see Appendix B).



- 4.A-VEG-2. MATURE FOREST, OPEN UNDERSTORY.** Maintain at least 100 blocks, distributed across all MAs, minimum 20 acres each, in the following condition: mature (80+ years old) mixed mesophytic, oak-pine and upland oak with open midstory/shrub layers; with scattered pockets (up to 1 acre) of 40-80 BA and burned areas. Maintain corridors between tracts using cliff zones or riparian zones (yellow-throated vireo).
- 4.A-VEG-4. DENSE UNDERSTORY.** Provide 19 blocks, minimum 110 acres each, distributed across all MAs in the following locations and conditions: 40-60 percent of the block will contain dense hardwood understory either with or without high canopy forest on damp, mesic slopes that preferably adjacent to the riparian-aquatic prescription area (Kentucky warbler, American redstart in part).
- 4.A-VEG-5. THINNED FOREST.** Provide at least seven tracts, approximately 250 acres each, distributed in all MAs, with emphasis in the Cumberland River MA stressing the following habitat conditions: semi-open canopy (around 60-70 BA), relatively dry, mature forest >80 years old (20 percent may be 0-80 year old forest), preferably dry-mesic pine-oak and dry-xeric pine-oak forest types, (dry-mesic oak and dry-xeric oak acceptable) with open midstory and shrub layers, in which burning and/or midstory treatments have occurred. Provide at least 15 snags/10 acres >14 inches dbh where available. Include approximately five percent of each block in permanent grassy/low shrub openings (at least two, min. one acre) (summer tanager, red-headed woodpecker, yellow-throated vireo, eastern wood pewee, northern flicker, Chuck-will's widow) [7 x 250 area areas = 1750 acres of thinning and burning, in age 80+ upland forest].
- 4.A-VEG-6. WOODED GRASSLAND/SHRUBLAND and WOODLAND.** Provide at least 67 blocks distributed in all MAs (minimum 30 blocks total in Cumberland MA and 10 Middle Kentucky MA), approximately 45 acres each, stressing the following habitat conditions: dry, mature (70-80 years +) forest (preferentially dry-mesic pine-oak and dry-xeric pine-oak, but dry-mesic oak, dry-xeric oak and general forest acceptable) with semi-open to open canopy (around 40-50 BA woodland) with open midstory and shrub layers, with at least 15 (>14 inches dbh) snags/ten acres. Approximately 20 percent of each block will be maintained in a combination of grassy openings and wooded grassland/shrubland. Burn blocks to maintain grassy/low shrub conditions (red-headed woodpecker, yellow-throated vireo, eastern wood pewee, northern flicker, summer tanager, chipping sparrow, Chuck-will's widow, prairie warbler) 56 x 45 acre areas = 2,700 acres of thinning and burning, in 80+ upland forest. (Changed 60 to 56, based on 200 acres provided in Upper Kentucky M.A for rosinweed in previous standard; also added 11 to get wooded grassland/shrubland. Added distribution in Cumberland MA and Middle Kentucky MA for prairie warbler.)
- 4.A-VEG-7. PINE WOODLAND AND WOODED GRASSLAND/SHRUBLAND.** Provide 100 blocks, minimum 19 acres each (50 blocks of 38 acres each preferred), distributed across all management areas (MAs), but with emphasis in the Cumberland and Middle Kentucky MAs, in the following habitat conditions: open to semi-open canopy (30-50 BA) with areas of little to no canopy (0-40 BA) in primarily southern yellow pine forest type, but can include dry-mesic pine-oak, dry-xeric pine-oak, dry-mesic oak, and dry-xeric oak forest types, with little to no midstory, but with areas of shrubs and generally grassy (warm season) herb layer; prescribed fire is beneficial. In addition, other grassland or old fields are likely to provide additional habitat (northern bobwhite quail, field sparrow, prairie warbler, Bachman's sparrow, yellow-throated warbler).

- 4.A-VEG-8. HARDWOOD WOODLAND.** Maintain eight blocks, minimum 25 acres each, in the following conditions: mixed mesophytic and dry-mesic oak forest (at least age 50) with open canopy (30-50 BA), midstory, shrub layers, mixed with openings and forest edge. Blocks are established at known locations of the Wasioto rosinweed. Use prescribed burning to maintain habitat and promote flowering in these blocks. (Based on current information; applies to Redbird Ranger District only.)
- 4.A-VEG-9. PINE AND/OR HEMLOCK.** Maintain at least 100 stands containing predominantly mature (80+ years) yellow pine and/or hemlock, minimum 15 acres each, distributed across all management areas (Sharp-shinned hawk – breeding habitat).
- 4.A-VEG-10. PINE FOREST, MIXED AGE.** Provide at least 100 blocks, minimum 330 acres each, distributed in the Licking MA (5 blocks), in the Middle Kentucky MA (30 blocks), and the Cumberland MA (65 blocks), in predominantly forested land of which one-half is mature (80+ years) dry-mesic pine-oak, dry-xeric pine-oak and/or southern yellow pine (30-100 percent pine component) with open canopy (60 –70 BA) and little to no midstory. Include at least 20 acres of woodland in conjunction with five acres of savanna and five acres of warm season grassy openings in 50 of the blocks. Must include pines >20 inches dbh (sharp-shinned hawk – foraging habitat, yellow-throated warbler, northern bobwhite quail, field sparrow).
- 4.A-VEG-11. SMALL MOIST GRASSY OPENINGS.** Provide at least one hundred generally forested blocks, minimum 12 acres each, distributed in all MAs. Each block will have 1-2 acres of openings. Each opening will contain the following habitat at least 0.25 acre in size: open ground, all with moist, poorly drained soils, considering areas such as bare ground, old fields, cultivated land, pastures, grassy openings, and 1-3 year-old regeneration areas on both NF and other ownerships. Needs edge habitat containing high shrub density areas and areas providing partial to wet thickets along meandering streams or swampy ground are preferred (American woodcock).
- 4.A-VEG-12. SHRUB OPENING.** Provide 100 blocks, minimum seven acres each, in the Upper Kentucky MA and Jellico Mountains area of the Cumberland MA with the following habitat conditions: scattered deciduous saplings, particularly black locust and sumac such as in regeneration areas (10-20 years) and overgrown fields in addition to forest with thick shrub and sapling layers; does not require high canopy (Yellow-breasted chat in part, Goldenwing warbler).
- 4.A-VEG-13. ERICACEOUS UNDERSTORY.** Provide at least 100 blocks, minimum eight acres each, distributed in all MAs with the following habitat conditions: moist, shady forest (>80 years old, based on DBNF data) on moderate to steep slopes in mixed mesophytic woods and riparian areas. Prefer dense understory of rhododendron and mountain laurel but will use undertory of woody deciduous trees. Require leaf litter on slopes for nesting. Avoids isolated tracts of forest (Worm-eating warbler).
- 4.A-VEG-14.** Provide at least 100 blocks, of minimum seven acres each, distributed in all Management Areas, in predominantly grass cover. At least half of the blocks are to be warm season grass (field sparrow; northern bobwhite quail, prairie warbler in part).

## 4.B. GENERAL FOREST AREA 1985 PLAN

[See the 1985 Land & Resource Management Plan, Management Areas 6 and 7.]

## 5.A. COMMUNICATIONS SITES

### Setting

Existing communications sites on the Daniel Boone National Forest are identified by district and type of use in Table 3 - 2.

**Table 3 - 2. Communications Sites and Use Type.**

<b>Communications Sites by District</b>	<b>Commercial Use</b>	<b>Administrative Use</b>
Morehead RD		
Triangle Mountain	X	
McCausey Ridge	X	
Stanton RD		
Pine Ridge		X
London RD		
Indian Trail Tower	X	
Indian Ridge	X	
McKee	X	
Baldrock		X
Somerset RD		
Mt. Victory	X	
Stearns RD		
Wiborg	X	
Redbird RD		
Bell Tower		X
Big Double		X
Cherry Tree		X
Hector	X	
Lucinda		X

This Prescription Area consists of approximately 20 acres across all Management Areas and is classified as Unsuitable for Timber Production (all cleared non-forest land).

## Desired Future Condition

**Emphasis of Condition:** The typical communications site is located on an accessible high point that encompasses several acres. Usually a security fence is placed around the communication facility. These are non-forest, small cleared sites containing communication tower(s). Most of these areas have associated special use authorizations.

**Desired Ecosystem Conditions:** Highly modified non-forest condition (predominantly grasses) is maintained.

**Desired Facilities and Human Activities:** Communications sites have adequate road access, one or more towers and equipment storage facilities located on open sites. These sites are infrequently visited by the permit holder(s), usually for maintenance purposes. Other activities are not encouraged at these sites. However, hiking may occur along roads that access communications sites.

## Goals and Objectives

**5.A-Goal 1.** Maintain a non-forest ground cover to protect the integrity of the soil and site and to buffer the towers and facilities from wildland fire.

**5.A-Goal 2.** Minimize potential for migratory bird mortality associated with these sites.

**5.A Objective-2.A.** Encourage modification of existing communication towers to minimize the potential for migratory bird mortality associated with these sites.

## Standards

### LANDS

**5.A-LAND-1.** Non-Forest Service communications sites require special use authorization.

### MINERALS

**5.A-MIN-1.** The surface is not to be disturbed during any federal mineral exploration or development activity; development of federally owned oil and gas is subject to the no surface occupancy stipulation.

### RECREATION

**5.A-REC-1.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, roaded natural, and rural.

### WILDLIFE

**5.A-WLF-1.** Design any new towers and ridge-top developments to minimize collision impacts by migratory birds.

## 5.C. SOURCE WATER PROTECTION

### Setting

This Prescription Area -- Zones 1 and 2 -- protects municipal drinking water sources and was developed in close cooperation with the Kentucky Division of Water (KDOW). Similar to the approach taken by the KDOW, each source water protection area is divided into zones<sup>24</sup>:

**Zone 1** – Begins one-quarter mile below the water intake site and extends five miles upstream (one mile up-channel in lakes) of the intake along any stream that is 3<sup>rd</sup> order or larger (on 1:24,000 scale topographic map). This zone includes the surface water and extends one-quarter mile from the shores of these streams or lakes (or nearest watershed boundary if within one-quarter mile).

**Zone 2** – Extends the protection area to 10 miles (5 miles up-channel in lakes) above the water intake along the source stream and any tributaries that are 3<sup>rd</sup> order or larger (on 1:24,000 scale topographic map). It includes Zone 1 and increases the total width to one-half mile from each side of these streams or lakes (or nearest watershed boundary if it is within one-half mile).

**Zone 3** – Extends 25 miles (10 miles up-channel in lakes) above the water intake along the source stream and any tributaries that are 3<sup>rd</sup> order or larger (on 1:24,000 scale topographic map). It includes the area of any 6<sup>th</sup> level hydrologic unit adjacent to these streams. Zone 3 is not part of this Prescription Area and is governed by Forestwide management direction.

This Prescription Area -- Zones 1 and 2 -- consists of approximately 34,015 acres across all Management Areas, of which 1,725 acres are surface water.

The portion of Zone 1 within 300 feet of a water body is Unsuitable for Timber Production – Tree cutting, tree removal, or timber harvest may occur on an unscheduled basis to attain Desired Future Conditions. Approximately 15,020 acres of the prescription area are Suitable for Timber Production (Scheduled Harvest) – Non-timber emphasis.

### Desired Future Condition

**Emphasis of Condition:** This area is managed to produce a relatively stable and continuous flow of clean, potable water to catchments or intakes of public water supplies.

**Desired Ecosystem Conditions:** Older forests characterize the first 300 feet of Zone 1. This zone is void of potential contaminants; stream sediment is at natural background levels.

The remainder of Zone 1 and Zone 2 are characterized by a range of forest ages with a few areas of regenerating forest resulting from long-rotation harvests. A relatively natural background level of sediment enters into local water supply catchments; no other pollutants occur.

Water quality conditions in both zones meet state Beneficial Use Standards for drinking water supplies.

**Desired Facilities and Human Activities:** A forest of little new development, low ground disturbance, and low road densities characterizes Zone 1. Dumps are cleaned up. Existing

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<sup>24</sup>All distances relate to “map distances”.

recreational facilities are maintained in top condition. Road, trail, and facility construction are relatively minor and very limited in nature. Lake shoreline stabilization is emphasized.

Zone 2 is characterized by low use that generates small, short-term amount of sedimentation and little or no contaminants compared to background levels. Dumps are cleaned up. Existing marinas, sewage treatment plants and recreational facilities are maintained in top condition and monitored to be within State water quality standards.

## Goals and Objectives

**5.C-Goal 1.** Provide clean water to public water supply intakes.

**5.C-Objective 1.A.** Meet or exceed state water quality and drinking water standards.

**5.C-Objective 1.B.** Close and/or rehabilitate roads determined to be causing degradation to water quality.

**5.C-Objective 1.C.** Stop illegal land and water dumping; take preventative measures to stop chemical spills and leaks.

**5.C-Objective 1.D.** Stop dumping of wastewater into source drinking waters through education programs and/or law enforcement action.

**5.C-Objective 1.E.** Stabilize reservoir shorelines where practical.

**5.C-Objective 1.F.** Take action to eliminate straight pipe sewage dumping that affects National Forest System lands.

**5.C-Objective 1.G.** Marinas, sewage treatment plants, and storage facilities will be maintained to prevent chemical spills and leaks.

**5.C-Objective 1.H.** Stabilize bare or disturbed soil.

**5.C-Goal 2.** Provide a relatively stable and continuous flow to public water supply intakes.

**5.C-objective-2.A.** Five percent of each source water unit beyond the first 300-foot zone should be in woodlands and/or 0-10 aged forest. This includes the effects of catastrophic events. This approximately 200 year rotation is designed to maintain a stable forested landscape within the Prescription Area.

**5.C-Goal 2.A.** Promote older forest conditions within the first 300 feet of Zone 1.

## Standards

### LANDS

**5.C-LAND-1.** New or replacement pipelines transporting materials that could adversely affect water quality must include protective measures such as double walls and leak detection devices.

### MINERALS

**5.C-MIN-1.** Within zone 1: the surface is not to be disturbed during any federal mineral exploration or development activity; development of federally owned oil and gas is subject to the no surface occupancy stipulation.

**5.C-MIN-2.** Within zone 2: development of federally owned oil and gas is subject to the controlled surface use stipulation; all other federal mineral activity will be implemented in accordance with the Desired Future Condition and standards of this prescription area.

### ROADS/ENGINEERING

**5.C-ENG-1.** Road or facility construction may be considered in Zone 1, only if site-specific analysis shows that new roads or facilities are compatible with state drinking water standards (401 KAR Chapter 8).

**5.C-ENG-2.** No hauling of Tier II chemicals<sup>25</sup> is permitted on National Forest System roads. The exception to this standard is the hauling of petroleum to marinas.

**5.C-ENG-3.** No new chemical storage facilities<sup>26</sup> will be constructed in Zone 1. Old facilities will be maintained or removed.

### RECREATION

**5.C-REC-1.** No trails designated for off-highway vehicle use will be allowed in Zone 1, except for minor encroachments to avoid steep terrain.

**5.C-REC-2.** Areas will be managed to meet or exceed Recreation Opportunity Spectrum experiences of semi-primitive non-motorized, semi-primitive motorized, roaded natural, and rural.

### VEGETATION

**5.C-VEG-1.** Timber harvesting and associated road construction will not occur within 300 feet of a perennial water body in Zone 1.

**5.C-VEG-2.** Pesticide use is not allowed in Zone 1 except where necessary to control the spread of insect or disease outbreaks.

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<sup>25</sup> Tier II chemicals are those having Material Safety Data Sheets (MSDS) and in quantities greater than 10,000 pounds for “hazardous substances” or smaller quantities as listed in 40 CFR Part 355 for “extremely hazardous chemicals”.

<sup>26</sup> Chemical storage facilities are defined in KRS Chapter 39E.



Logging Operation on the Daniel Boone National Forest



# Appendix G

## MAPS

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The following maps are intended to provide the reader with a broad point of reference. These maps are not intended to provide detail sufficient to locate specific points of interest. The first map shows where the Daniel Boone National Forest (DBNF) occurs within Kentucky. The second map shows the proximity of some of the larger cities to the DBNF. The third map shows the counties that are within the proclamation boundary of the DBNF and those that are in close proximity. The remaining maps are of individual Prescription Areas. The Prescription Area maps are not of a scale that can be used to locate specific areas of interest. Rather, the Prescription Area maps show their relative size and distribution across the DBNF. Not all Prescription Areas are mapped. The Significant Bat Cave Prescription Areas were not mapped because precise locations are not available and because of the sensitivity of these locations. These Prescription Areas occur based on description. Readers should be aware that some Prescriptions Areas overlap. These maps were prepared using the Forest's corporate Geographic Information System database.

### Disclaimer:

The Forest Service uses the most current and complete data available. Geographic Information System (GIS) data and product accuracy may vary. For example, products may be: developed from sources of differing accuracy, accurate only at certain scales, based on modeling or interpretation, incomplete while being created or revised. Using GIS products for purposes other than those, for which they were created, may yield inaccurate or misleading results. The Forest Service reserves the right to correct, update, modify, or replace GIS products without notification. For more information, contact the Daniel Boone National Forest at 1700 Bypass Road, Winchester, KY 40391, (859) 745-3100.

## Maps

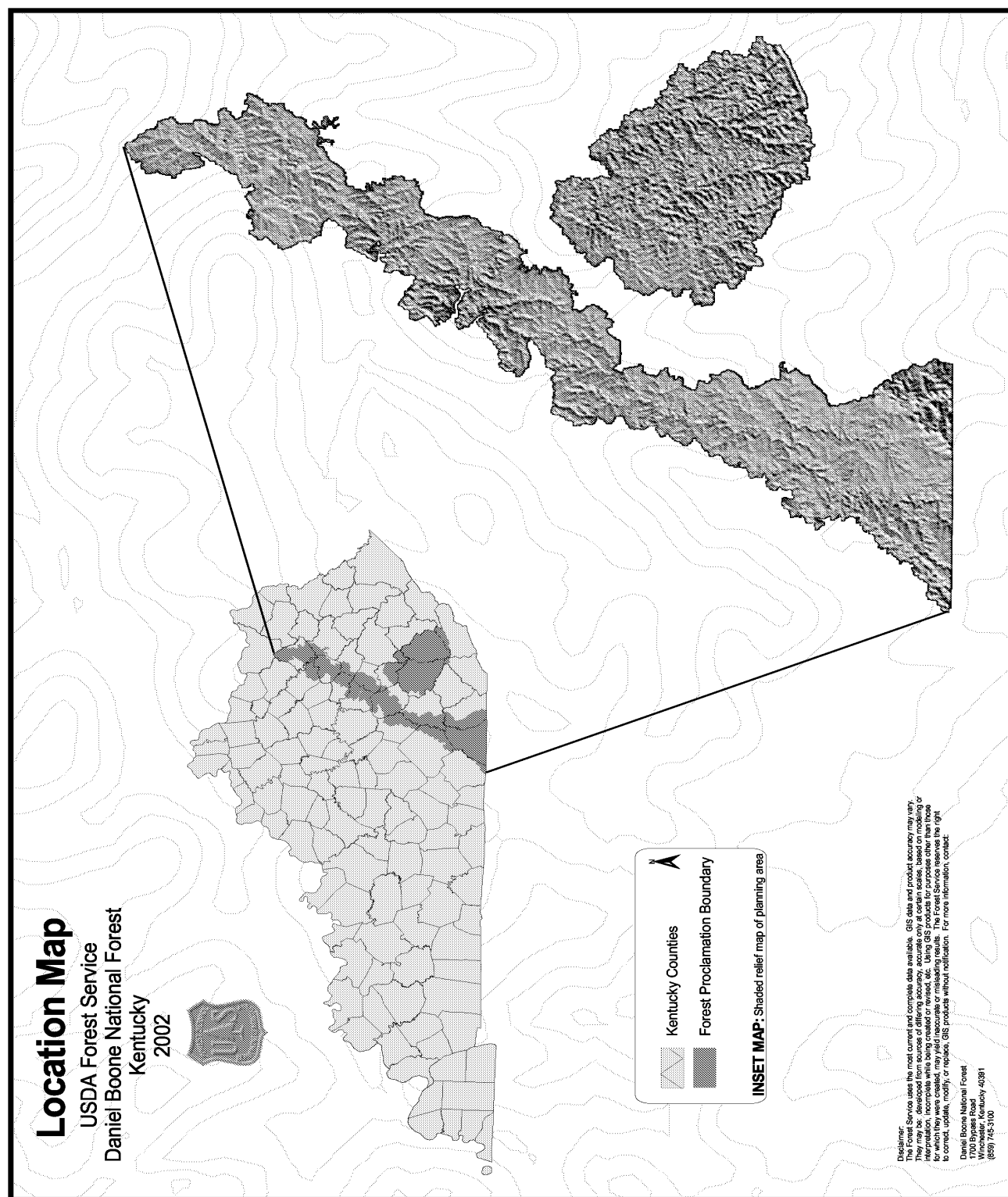


Figure G - 1. Daniel Boone National Forest Vicinity Map/Proclamation Boundary

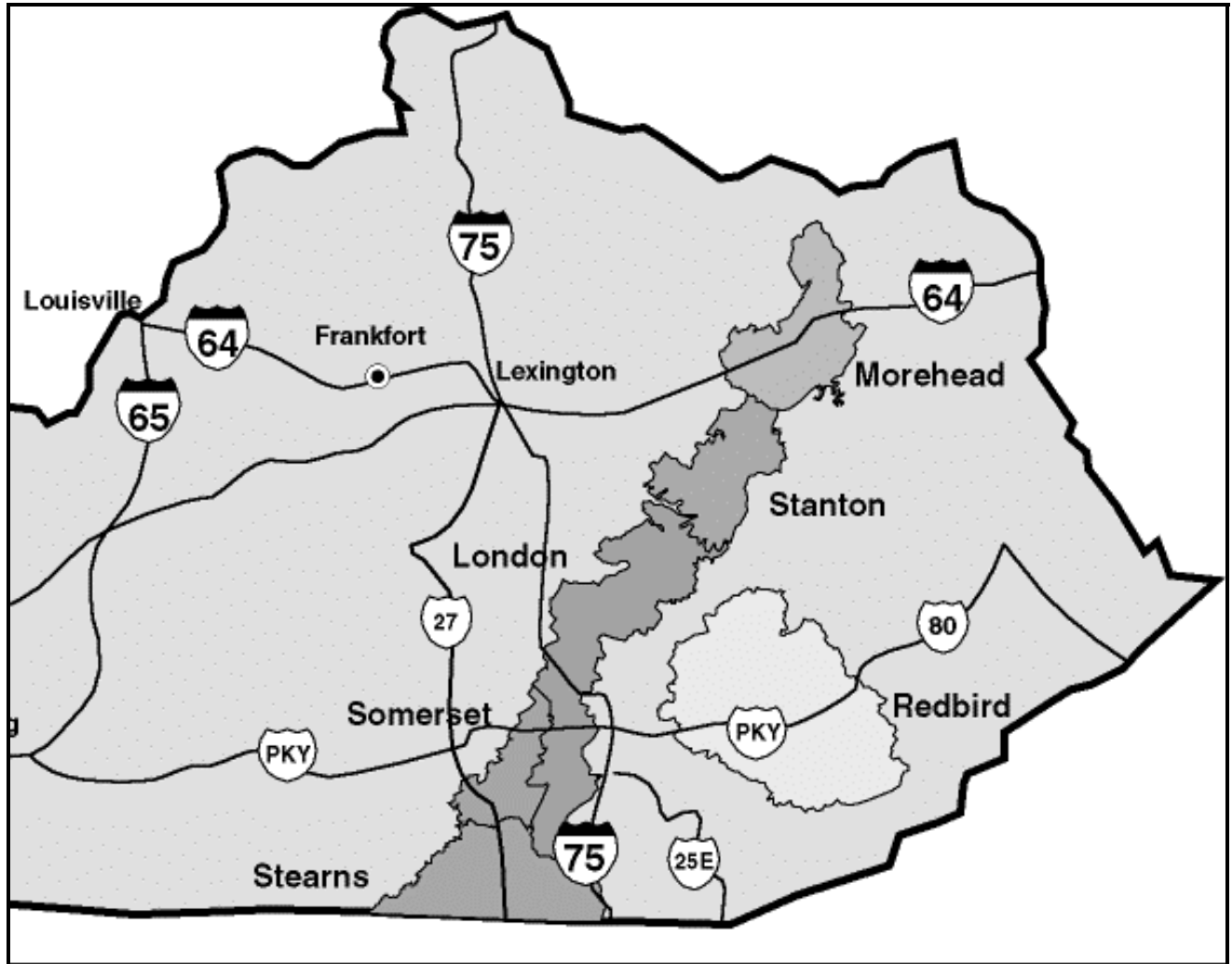


Figure G - 2. Map with Major Communities

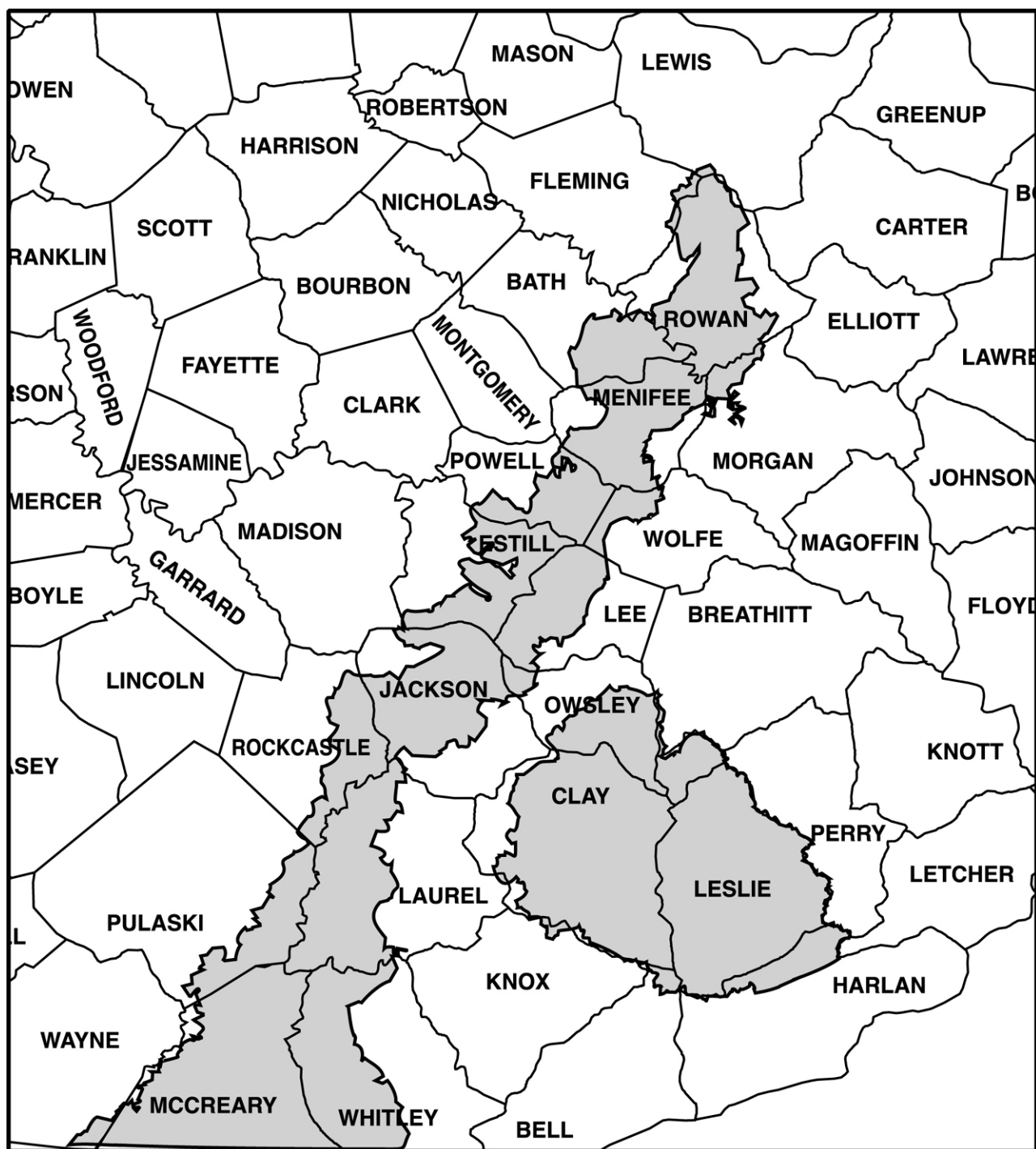


Figure G - 3. Counties in Daniel Boone National Forest vicinity

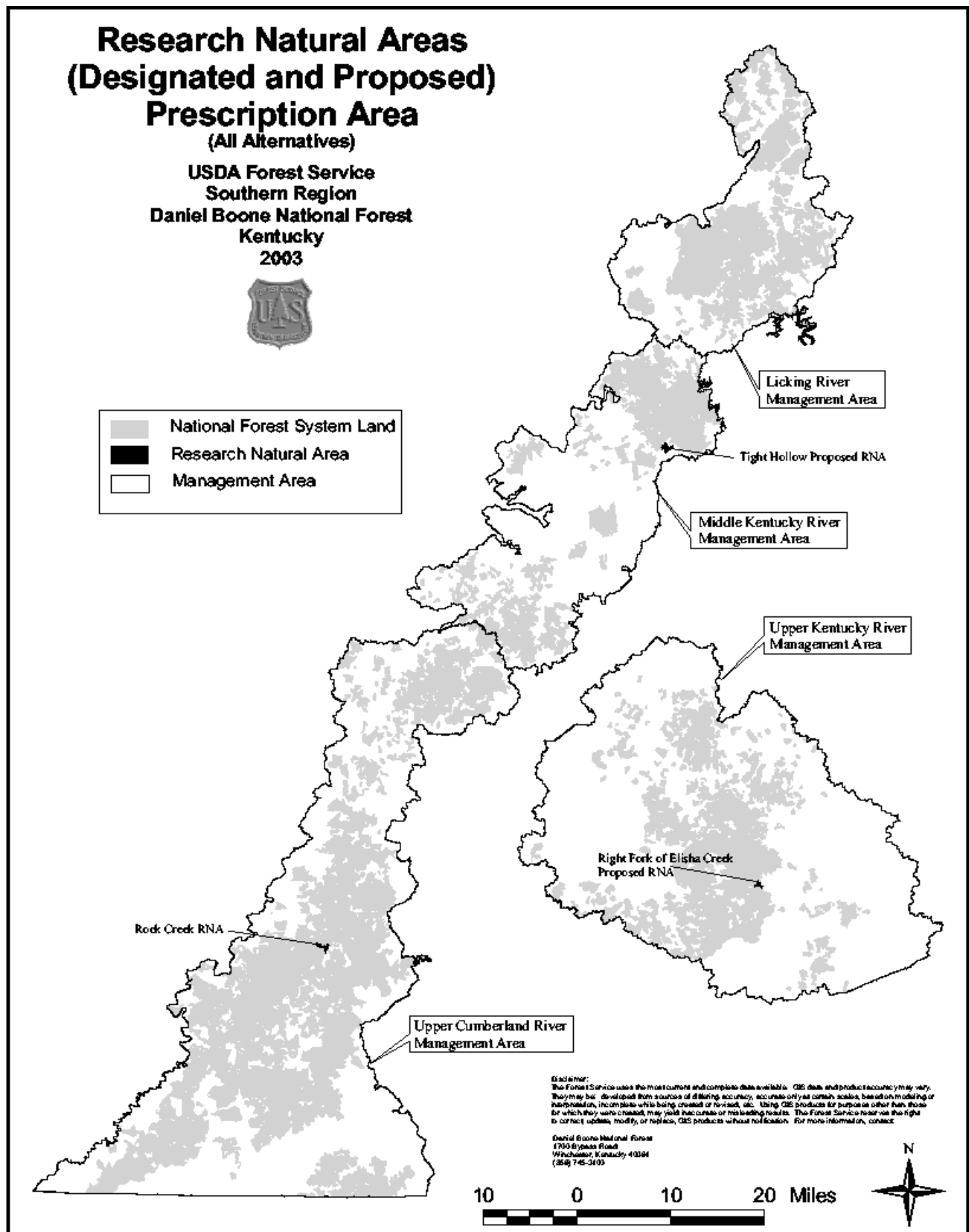


Figure G - 4. Research Natural Area

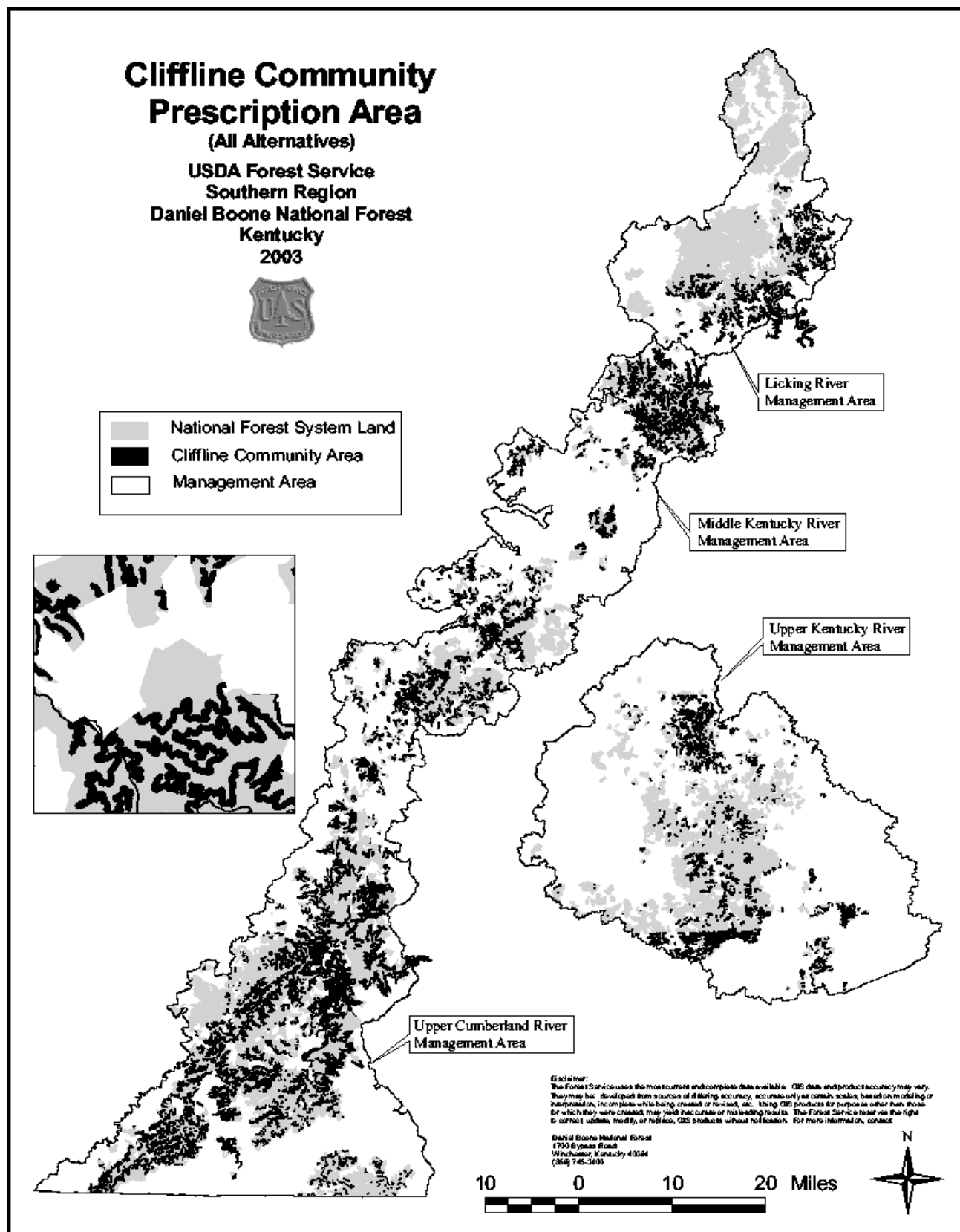


Figure G - 5. Cliffline Community

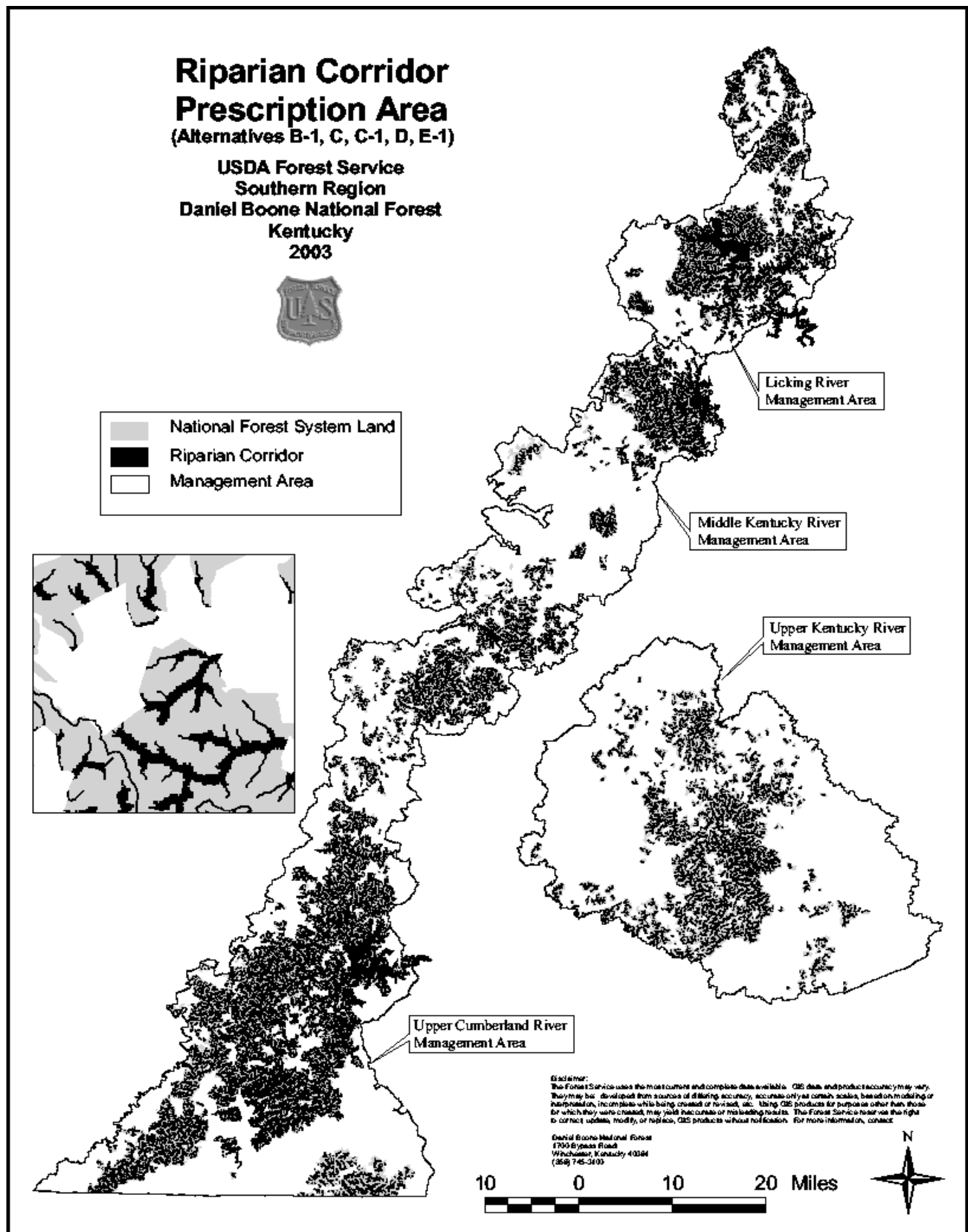


Figure G - 6. Riparian Corridor

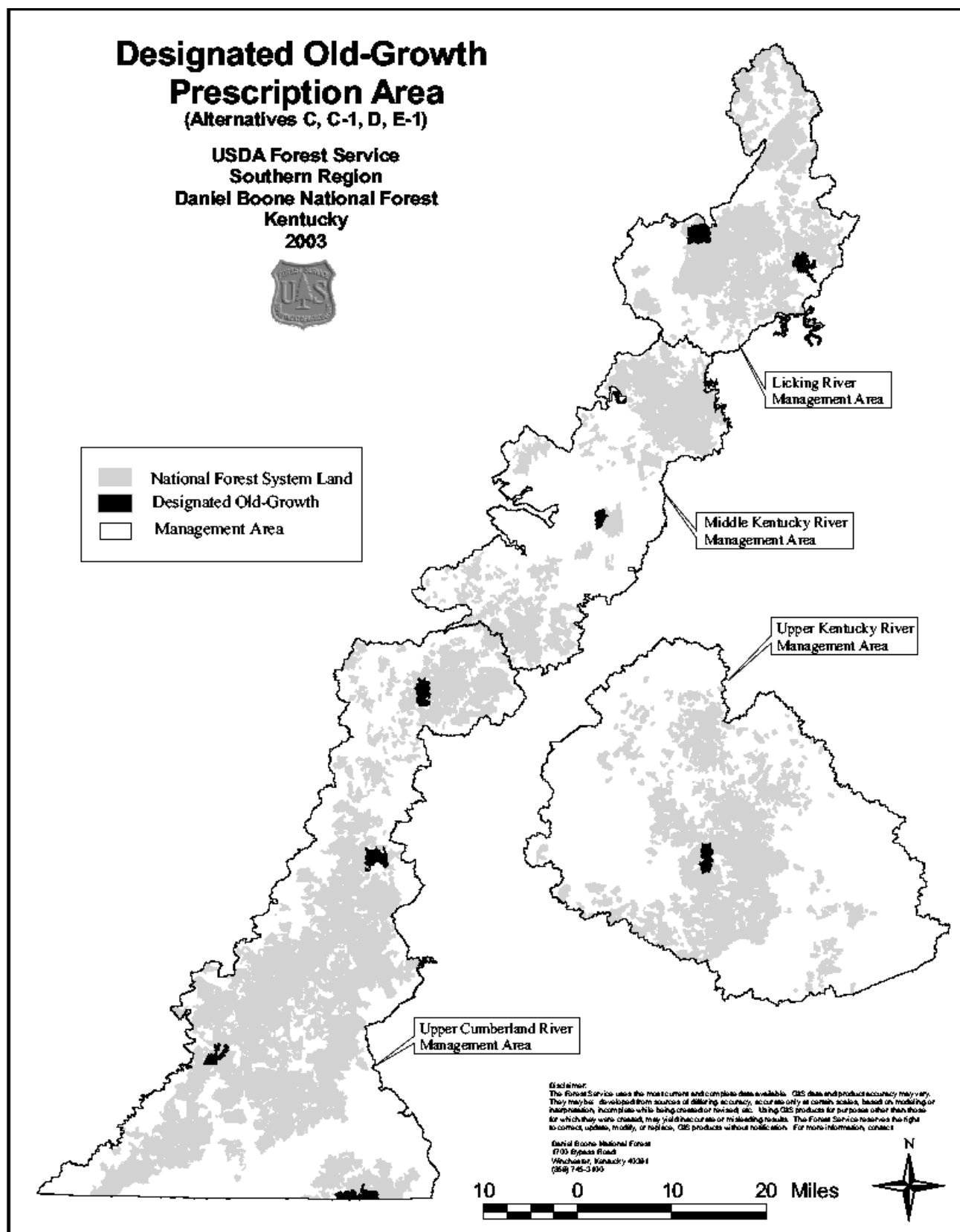


Figure G - 7. Designated Old-Growth



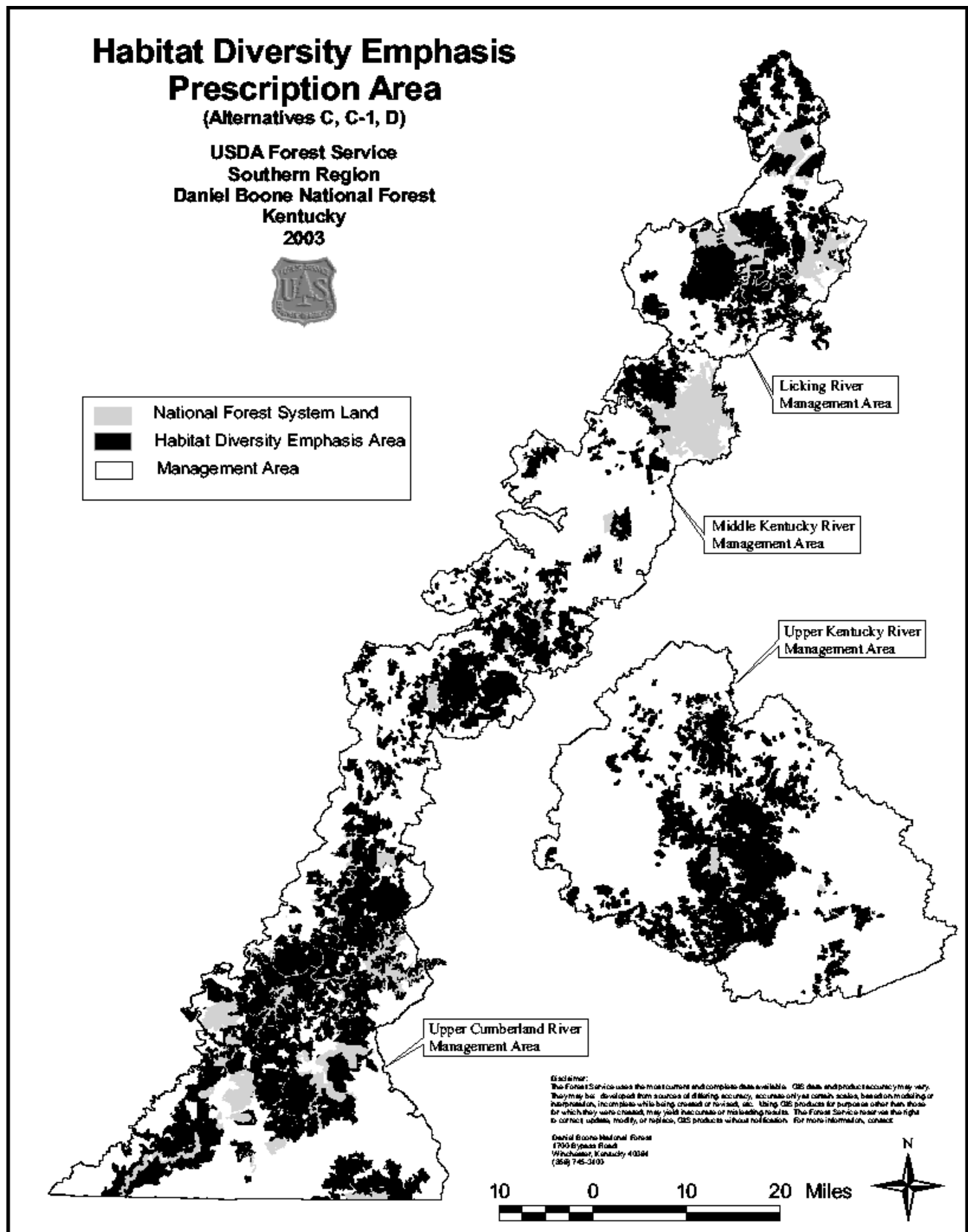


Figure G - 8. Habitat Diversity Emphasis

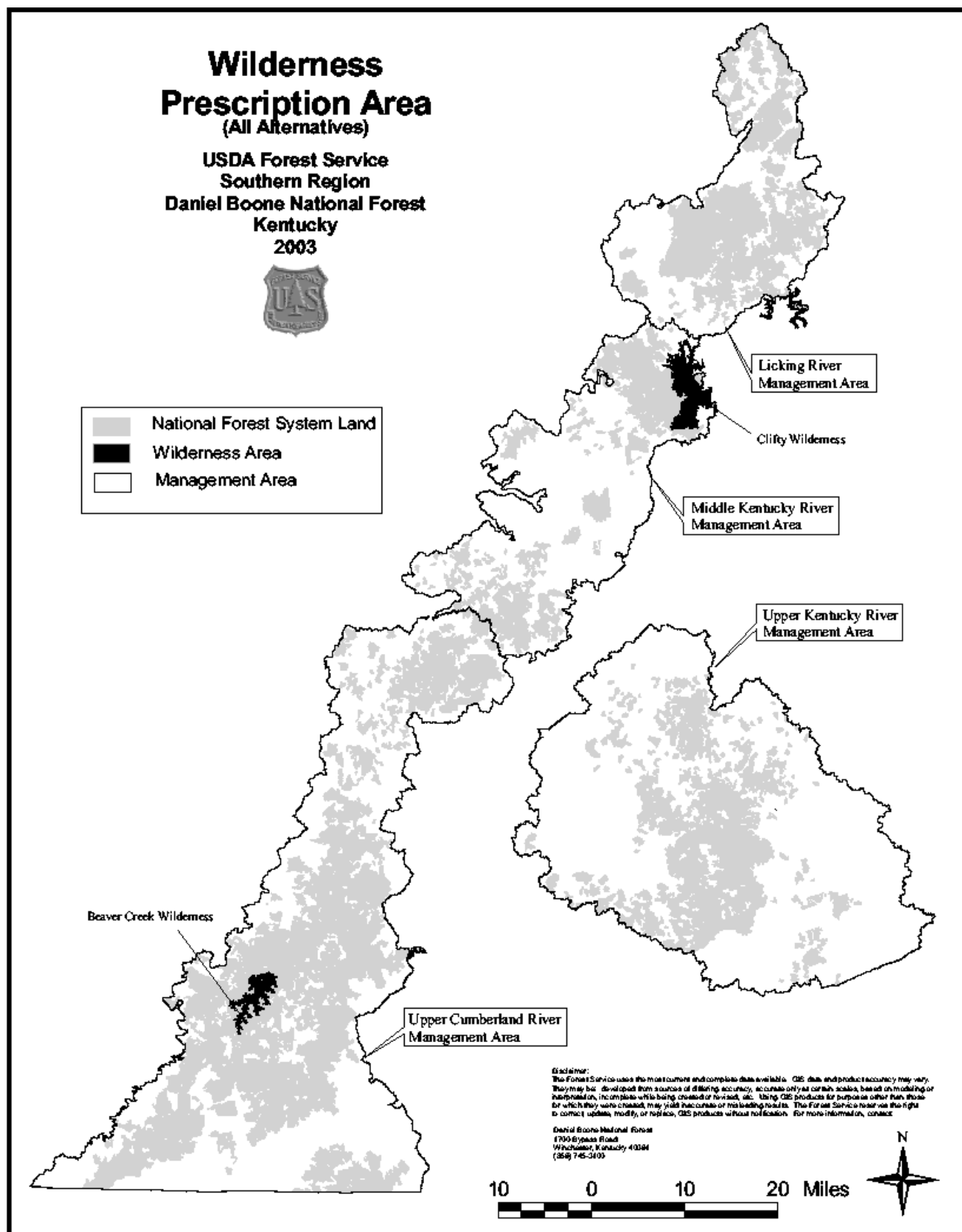


Figure G - 9. Wilderness

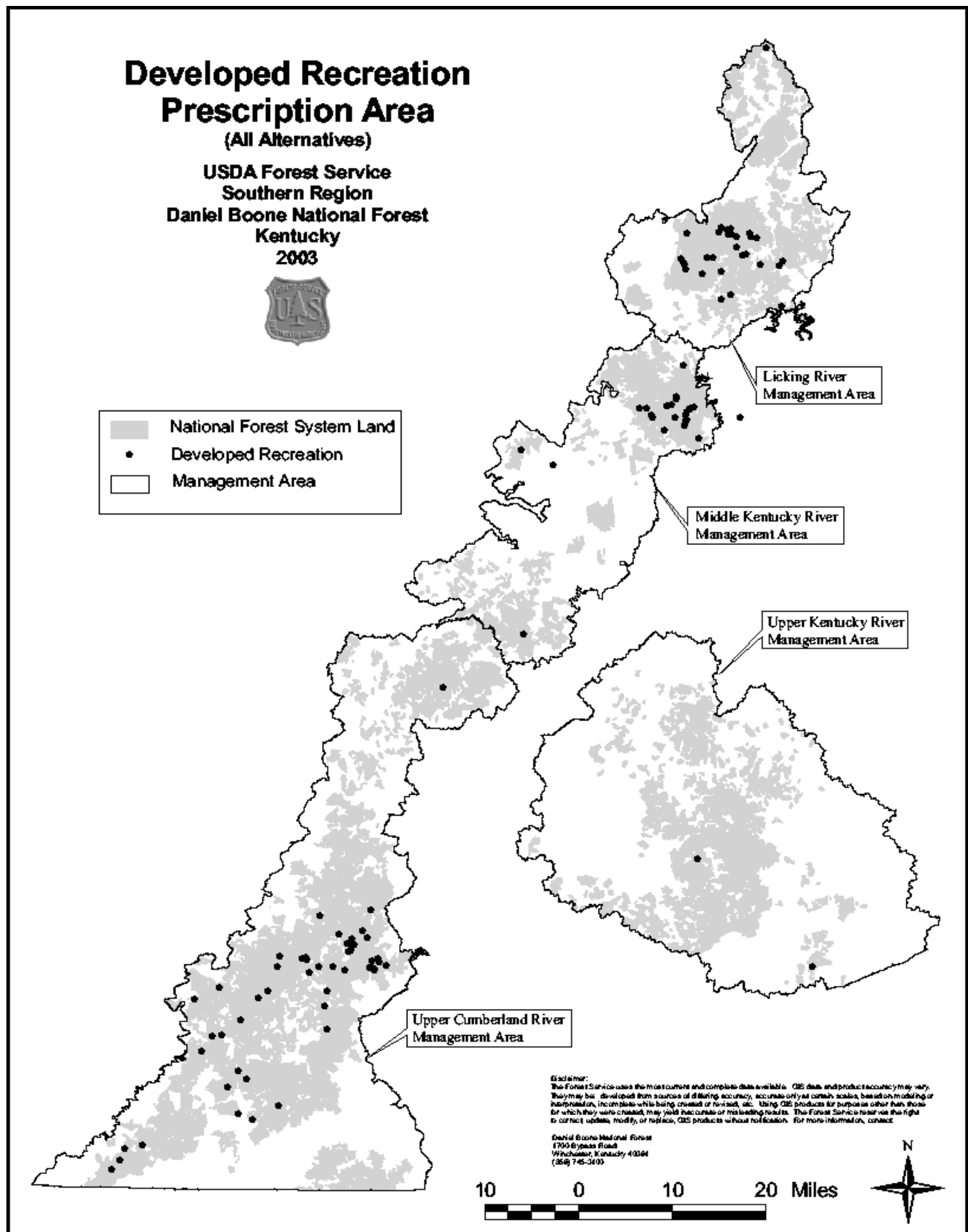


Figure G - 10. Developed Recreation

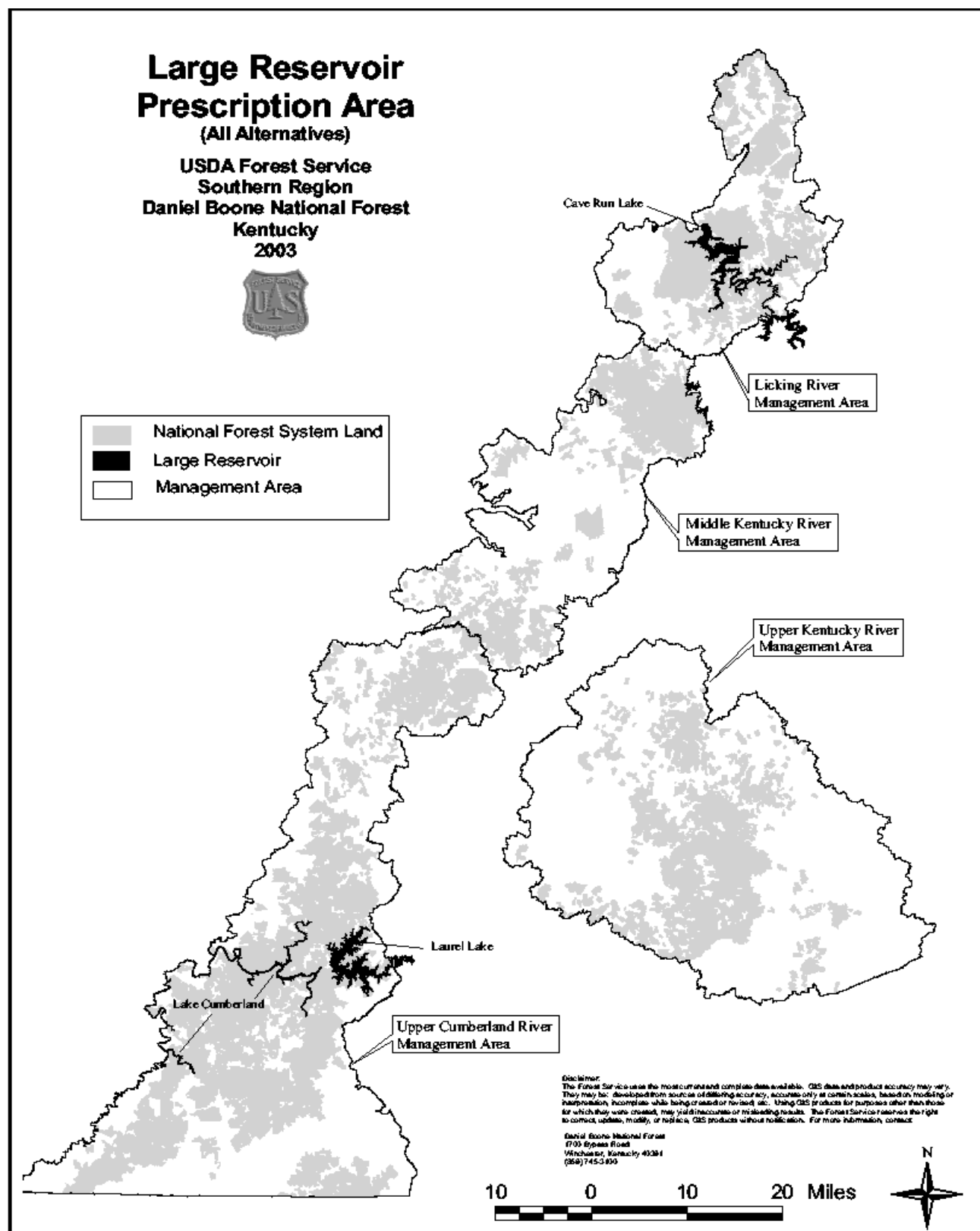


Figure G - 11. Large Reservoirs

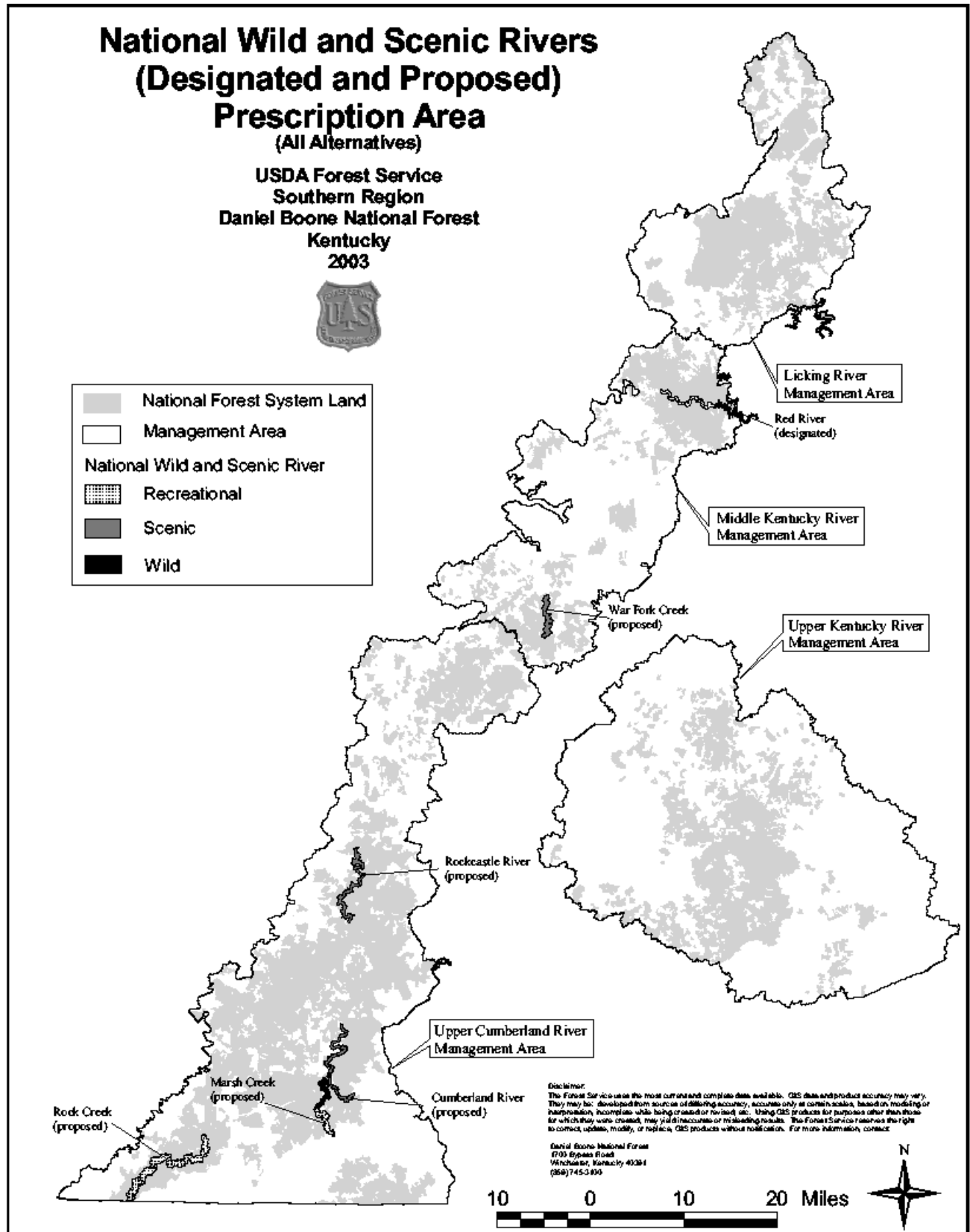


Figure G - 12. National Wild and Scenic River – Designated and Proposed

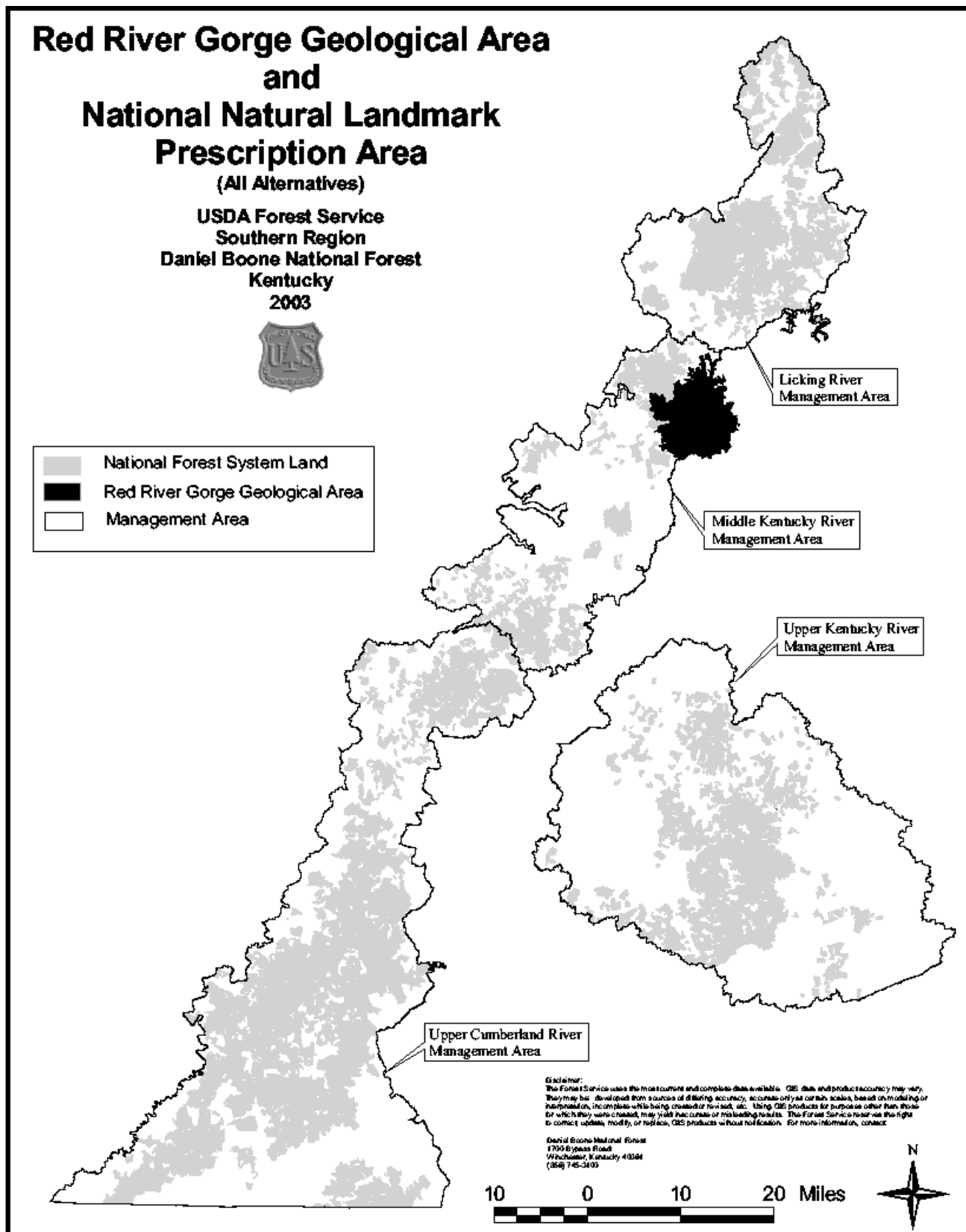


Figure G - 13. Red River Gorge Geological Area

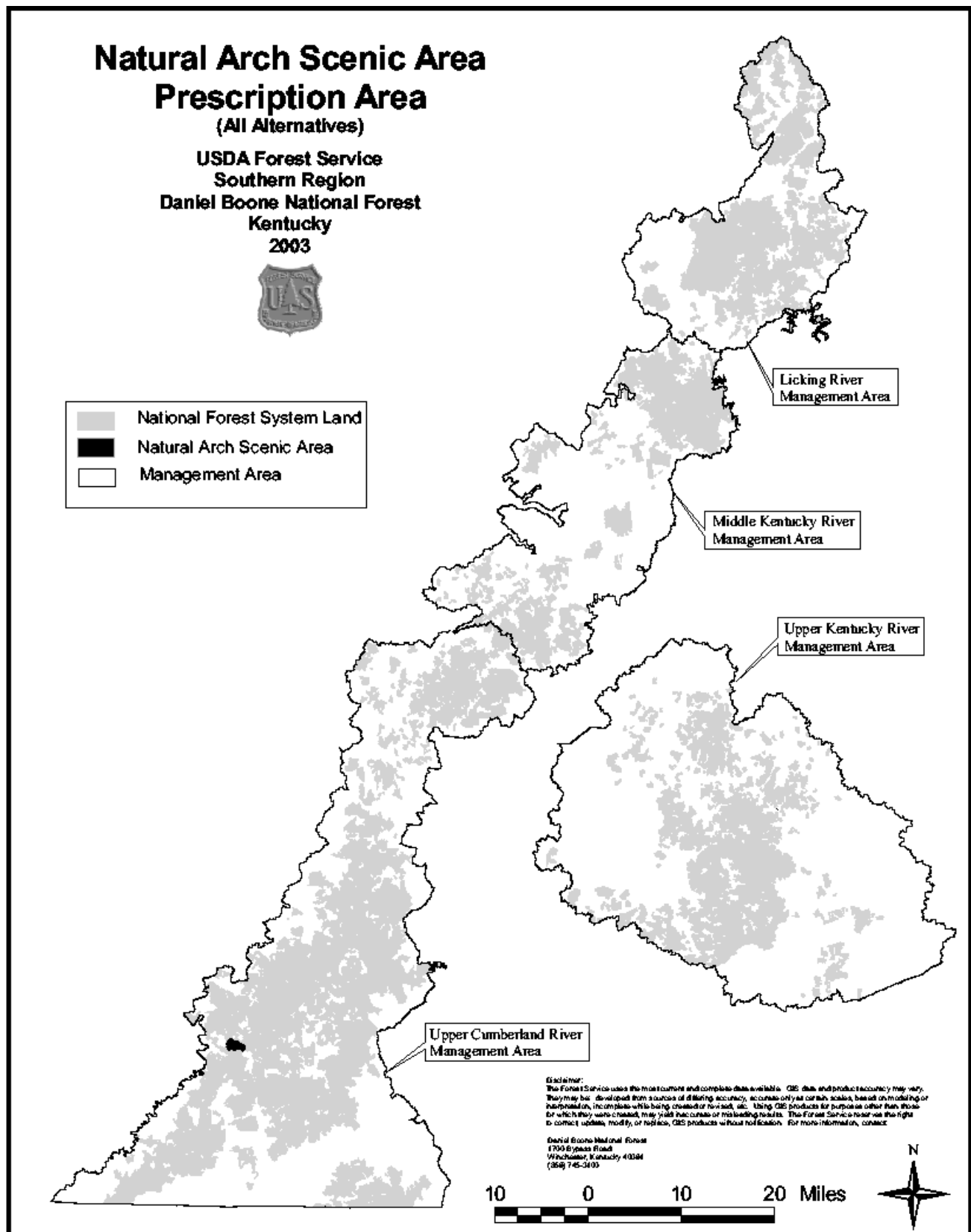


Figure G - 14. Natural Arch Scenic Area

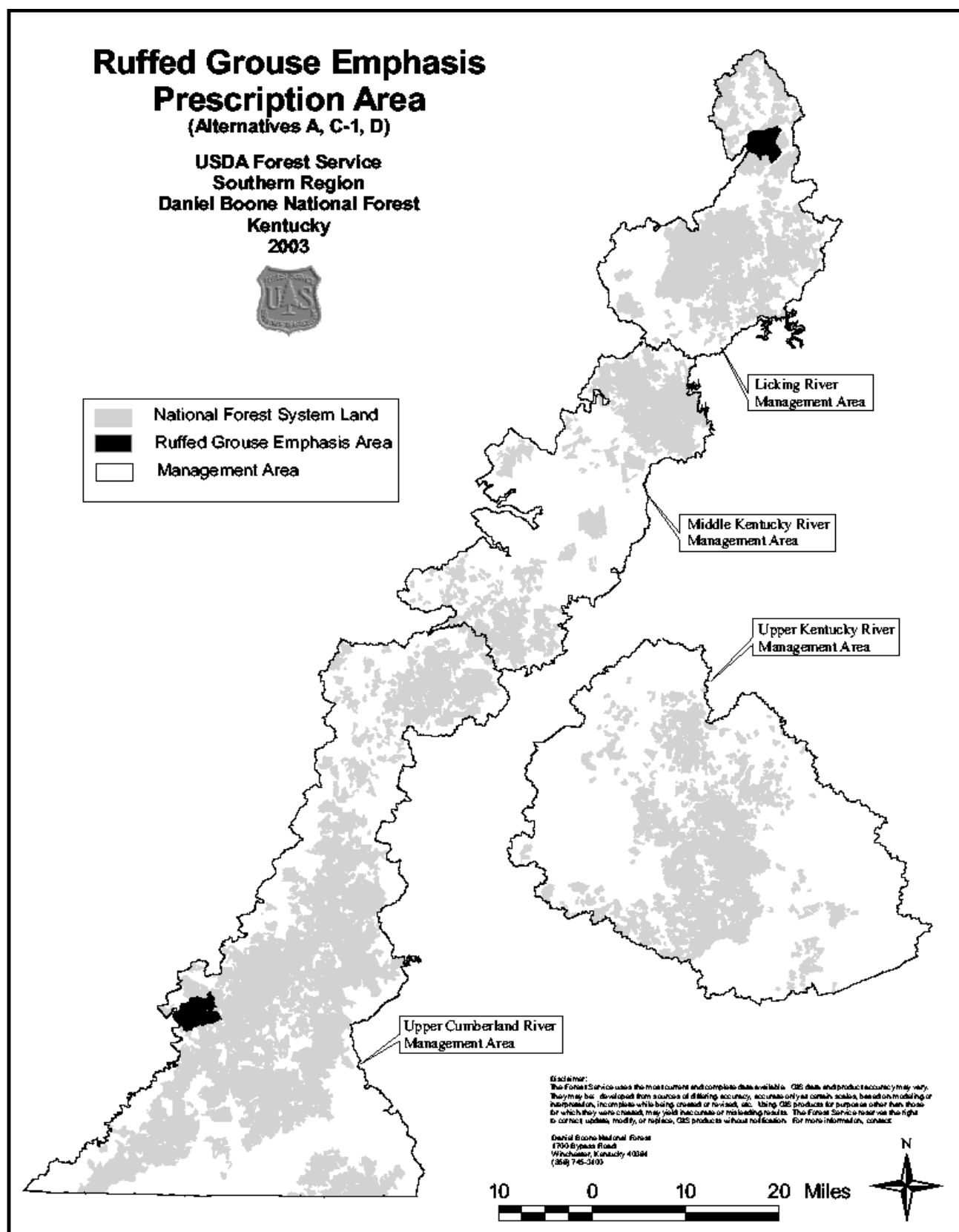


Figure G - 15. Ruffed Grouse Emphasis



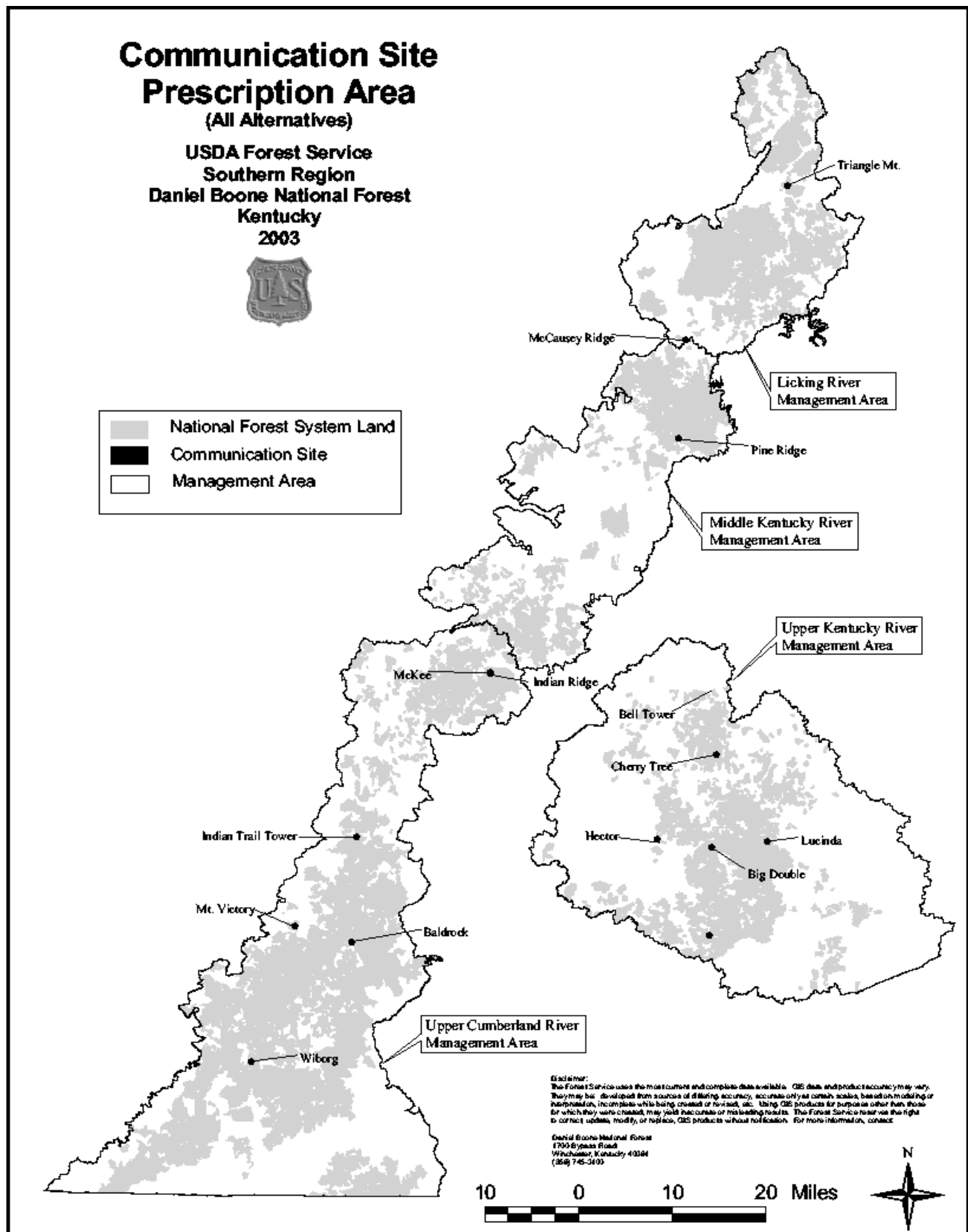


Figure G - 16. Communications Sites

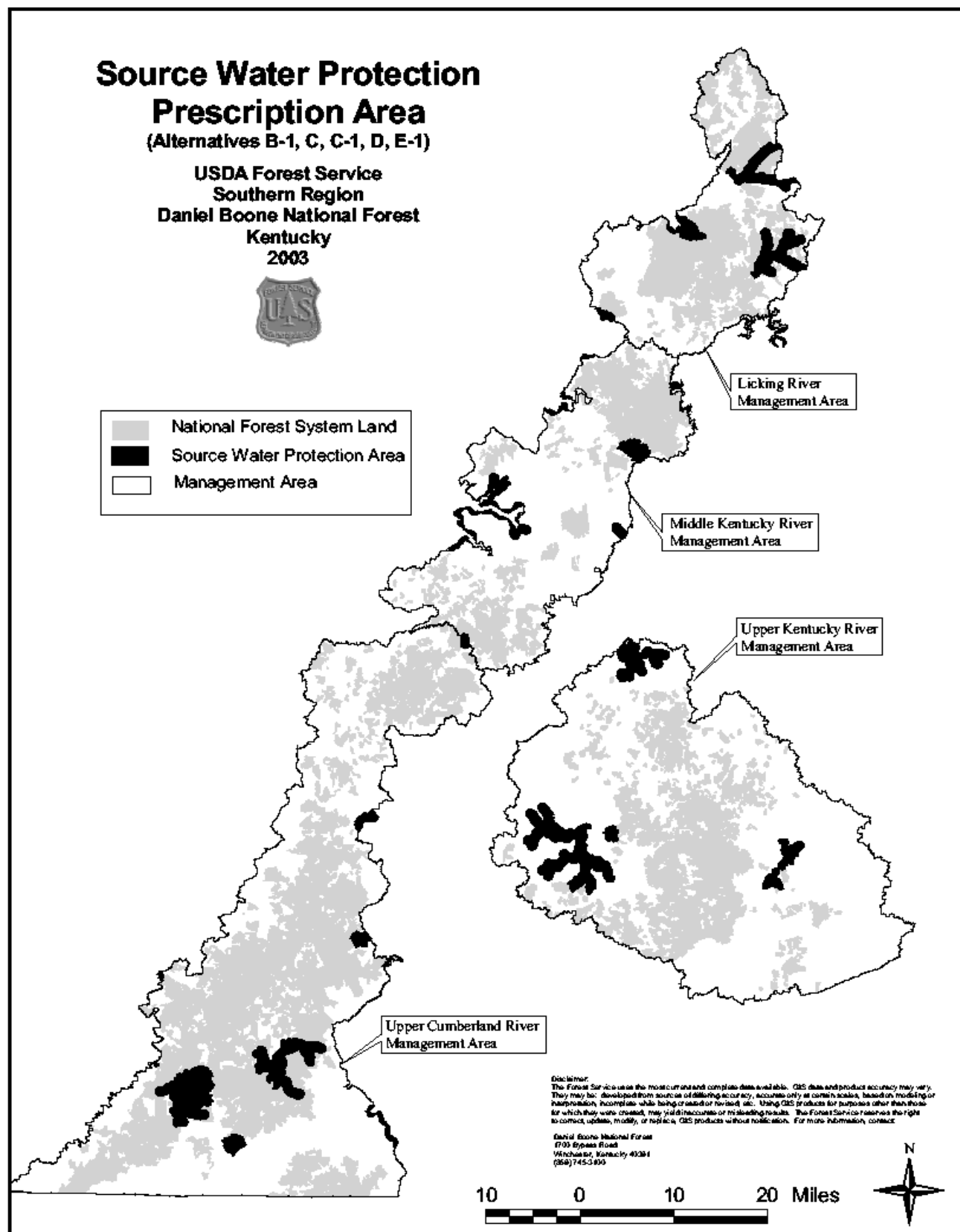


Figure G - 17. Source Water Protection

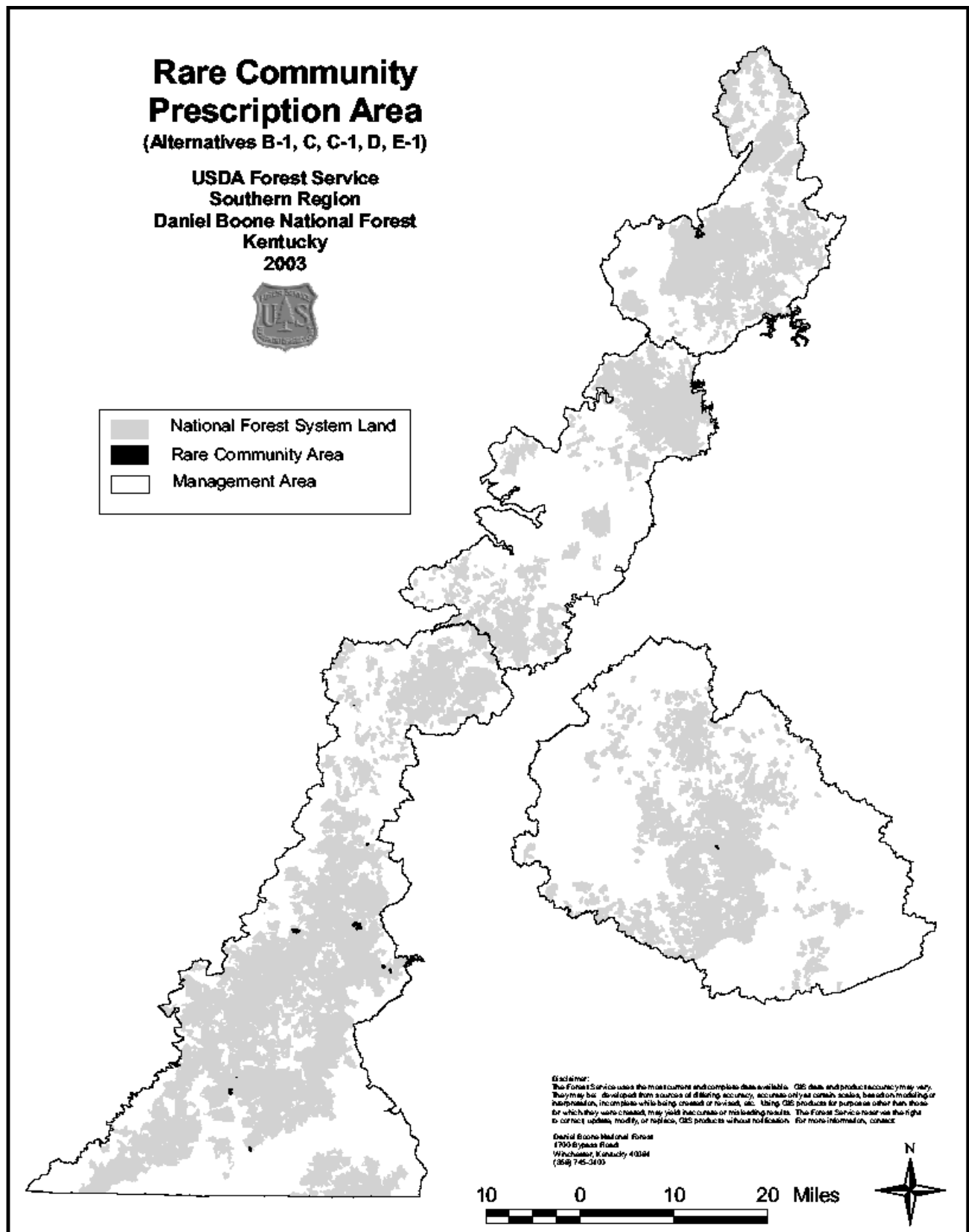


Figure G - 18 Rare Community



Overlook of Natural Arch, Somerset Ranger District

# Appendix H

## VIABILITY EVALUATION TABLES

### TERRESTRIAL HABITAT ELEMENTS, TABLE H – 1

Outcomes for terrestrial habitat elements are provided in Table H - 1, using the four variables described in the Terrestrial Species Viability Evaluation section of Chapter 3. These variables indicate expected habitat condition following 50 years of implementing each alternative.

#### Key to Table H – 1

**Habitat Abundance** – Values used to categorize projected abundance of each habitat element after 50 years of implementing each forest plan revision alternative.

##### Code Description

- R Rare. The habitat element is rare, with generally less than 100 occurrences, or patches of the element generally covering less than one percent of the planning area.
- O Occasional. The habitat element is encountered occasionally, and generally found on one to ten percent of the planning area.
- C Common. The habitat element is abundant and frequently encountered, and generally found on more than ten percent of the planning area.

**Habitat Distribution** – Values used to categorize projected distribution of each habitat element after 50 years of implementing each forest plan revision alternative.

##### Code Description

- P Poor. The habitat element is poorly distributed within the planning area and intermixed lands relative to conditions present prior to European settlement. Number and size of high quality habitat patches is greatly reduced.
- F Fair. The habitat element is fairly well distributed within the planning area and intermixed lands relative to conditions present prior to European settlement. Number and size of high quality habitat patches is somewhat reduced.
- G Good. The habitat element is well distributed within the planning area and intermixed lands relative to conditions present prior to European settlement. Number and size of high quality habitat patches is similar to or only slightly reduced relative to reference conditions.

**Likelihood of Limitation** – General likelihood that the habitat element will be limiting to viability of associated species based on its abundance and distribution. See text for description of process used to determine likelihood of limitation.

##### Code Description

- L Low
- M Moderate
- H High

**Management Effect** – Values used to categorize the role of management effects on each habitat element for each forest plan revision alternative.

**Code    Description**

- 1      Abundance and distribution of the habitat element is maintained or improved by providing optimal protection, maintenance, and restoration to all occurrences (with limited exceptions in some cases). Little additional opportunity exists to decrease risk to viability of associated species because management is at or near optimal.
- 2      Abundance and distribution of the habitat element is improved through purposeful restoration, either through active management or passively by providing for successional progression. Opportunity for decreasing risk to associated species is primarily through increasing rates of restoration, where possible.
- 3      The habitat element is maintained at approximately current distribution and abundance, though location of elements may shift over time as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to increase abundance and distribution of the habitat element.
- 4      Regardless of management efforts, the habitat element is expected to decrease in distribution and abundance as a result of factors substantially outside of Forest Service control (e.g., invasive pests, acid deposition). Opportunity to reduce risk to viability of associated species is primarily through cooperative ventures with other agencies and organizations.
- 5      The habitat element is expected to decrease in distribution and abundance as a result of management action or inaction. Opportunity to reduce risk to viability of associated species is primarily through adopting and implementing objectives to maintain or increase this habitat element.

**Table H - 1. Summary of expected abundance, distribution, likelihood of limitation, and management effects for habitat elements by alternative.**

<b>Habitat Elements</b>	<b>A</b>	<b>B-1</b>	<b>C</b>	<b>C-1</b>	<b>D</b>	<b>E-1</b>
<b>Bogs, Springs, and Seeps</b>						
Abundance	R	R	R	R	R	R
Distribution	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M
Management Effects	3	3	1	1	1	3
<b>Wetlands</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	3	3	1	1	1	3
<b>Glades and Prairies</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	F	F	F	F
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	5	5	1	1	1	5
<b>River Channels</b>						
Abundance	C	C	C	C	C	C
Distribution	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	4	4	4	4	4	4
<b>Spray Cliffs</b>						
Abundance	R	R	R	R	R	R
Distribution	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M
Management Effects	1	1	1	1	1	1
<b>Canebrakes</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	F	F	F	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	5	3	1	1	1	3
<b>Caves</b>						
Abundance	R	R	R	R	R	R
Distribution	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M
Management Effects	1	1	1	1	1	1
<b>Cliffline</b>						
Abundance	C	C	C	C	C	C
Distribution	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	1	1	1	1	1	1

<b>Habitat Elements</b>	<b>A</b>	<b>B-1</b>	<b>C</b>	<b>C-1</b>	<b>D</b>	<b>E-1</b>
<b>Dry-Xeric Cedar Oak</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	5	3	1	1	1	3
<b>Woodland</b>						
Abundance	R	R	O	O	O	R
Distribution	P	P	G	G	G	P
Likelihood of Limitation	H	H	L	L	L	H
Management Effects	5	3	1	1	1	3
<b>Wooded Grassland/Shrubland</b>						
Abundance	R	R	O	O	O	R
Distribution	P	P	G	G	G	P
Likelihood of Limitation	H	H	L	L	L	H
Management Effects	3	5	1	1	1	3
<b>Grass/Forb Woodland or Wooded Grassland</b>						
Abundance	R	R	O	O	O	R
Distribution	P	P	G	G	G	P
Likelihood of Limitation	H	H	L	L	L	H
Management Effects	5	3	1	1	1	3
<b>Canopy Gaps</b>						
Abundance	O	C	C	C	C	O
Distribution	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	3	2	2	2	2	2
<b>Mature Yellow Pine and Mixed Pine-Oak</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	2	2	2	2	2	2
<b>Mature Pitch Pine</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	5	2	2	2	2	2
<b>Old Forests with Dead/Dying Large Trees</b>						
Abundance	O	C	C	C	C	O
Distribution	F	G	G	G	G	F
Likelihood of Limitation	M	L	L	L	L	M
Management Effects	5	2	2	2	2	5
<b>Early-age Yellow Pine and Mixed Pine-Oak</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	3	3	3	3	3	3



<b>Habitat Elements</b>	<b>A</b>	<b>B-1</b>	<b>C</b>	<b>C-1</b>	<b>D</b>	<b>E-1</b>
<b>Mature/Old-aged Beech</b>						
Abundance	R	R	R	R	R	R
Distribution	P	G	G	G	G	G
Likelihood of Limitation	H	M	M	M	M	M
Management Effects	5	2	2	2	2	2
<b>Mature Hemlock-White Pine</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	4	4	4	4	4	4
<b>Mature High-Elev. Mesic Hardwood (Pine Mtn.)</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	4	4	4	4	4	4
<b>High Elevation Early-aged Forest (Pine Mtn.)</b>						
Abundance	R	R	R	R	R	R
Distribution	P	P	P	P	P	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	4	4	4	4	4	4
<b>Mature Xeric-Mesic Oak</b>						
Abundance	C	O	C	C	C	C
Distribution	G	F	G	G	G	G
Likelihood of Limitation	L	M	L	L	L	L
Management Effects	2	5	2	2	2	2
<b>Mixed Mesophytic Hardwood</b>						
Abundance	C	C	C	C	C	C
Distribution	F	F	F	F	F	F
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3
<b>Mature Forest Interior</b>						
Abundance	C	C	C	C	C	C
Distribution	F	G	G	G	G	F
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	5	2	2	2	2	3
<b>Mature Forest (general)</b>						
Abundance	C	C	C	C	C	C
Distribution	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	5	2	2	2	2	3

<b>Habitat Elements</b>	<b>A</b>	<b>B-1</b>	<b>C</b>	<b>C-1</b>	<b>D</b>	<b>E-1</b>
<b>Mature/old-aged Riparian Forest</b>						
Abundance	C	C	C	C	C	C
Distribution	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	3	2	2	2	2	2
<b>Riparian (general)</b>						
Abundance	C	C	C	C	C	C
Distribution	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	3	3	3	3	3	3
<b>Mid-Aged Forest</b>						
Abundance	C	C	C	C	C	C
Distribution	G	F	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	2	3	3	3	3	2
<b>Mixed Forest Landscape</b>						
Abundance	C	O	C	C	C	C
Distribution	F	P	G	G	G	G
Likelihood of Limitation	L	H	L	L	L	L
Management Effects	3	5	2	2	2	3
<b>Grassland</b>						
Abundance	R	R	R	R	R	R
Distribution	F	P	F	F	F	P
Likelihood of Limitation	H	H	H	H	H	H
Management Effects	2	5	2	2	2	5
<b>Early-aged Forest</b>						
Abundance	O	R	O	O	O	O
Distribution	G	P	G	G	G	G
Likelihood of Limitation	L	H	L	L	L	L
Management Effects	2	5	2	2	2	2
<b>Fire Adapted/Enhanced</b>						
Abundance	O	R	C	C	C	O
Distribution	F	P	F	F	F	F
Likelihood of Limitation	M	H	L	L	L	M
Management Effects	3	5	2	2	2	3
<b>Hard Mast</b>						
Abundance	C	O	C	C	C	C
Distribution	G	F	G	G	G	G
Likelihood of Limitation	L	M	L	L	L	L
Management Effects	2	5	2	2	2	2
<b>Snags</b>						
Abundance	O	C	C	C	C	O
Distribution	F	G	G	G	G	F
Likelihood of Limitation	M	L	L	L	L	M
Management Effects	3	2	2	2	2	3

<b>Habitat Elements</b>	<b>A</b>	<b>B-1</b>	<b>C</b>	<b>C-1</b>	<b>D</b>	<b>E-1</b>
<b>Open Midstory and Understory</b>						
Abundance	O	R	O	O	O	O
Distribution	F	P	F	F	F	F
Likelihood of Limitation	M	H	M	M	M	M
Management Effects	3	5	2	2	2	3
<b>Dense High Shrub Understory</b>						
Abundance	O	R	O	O	O	O
Distribution	G	P	G	G	G	G
Likelihood of Limitation	L	H	L	L	L	L
Management Effects	3	5	2	2	2	3
<b>Early-aged Riparian Forest</b>						
Abundance	O	R	R	R	R	R
Distribution	G	F	F	F	F	F
Likelihood of Limitation	L	H	H	H	H	H
Management Effects	3	1	1	1	1	1
<b>Downed Wood</b>						
Abundance	O	C	C	C	C	O
Distribution	F	G	G	G	G	F
Likelihood of Limitation	M	L	L	L	L	M
Management Effects	5	2	2	2	2	2
<b>Den Trees</b>						
Abundance	O	C	C	C	C	O
Distribution	F	G	G	G	G	F
Likelihood of Limitation	M	L	L	L	L	M
Management Effects	3	2	2	2	2	2
<b>Water (distance sensitive)</b>						
Abundance	C	C	C	C	C	C
Distribution	G	G	G	G	G	G
Likelihood of Limitation	L	L	L	L	L	L
Management Effects	2	2	2	2	2	2
<b>Lakeshores, large reservoirs</b>						
Abundance	R	R	R	R	R	R
Distribution	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M
Management Effects	3	3	3	3	3	3
<b>Pond Shore</b>						
Abundance	R	R	R	R	R	R
Distribution	G	G	G	G	G	G
Likelihood of Limitation	M	M	M	M	M	M
Management Effects	2	2	2	2	2	2

## RATINGS OF RISK FOR TERRESTRIAL SPECIES, TABLE H - 2

Ratings of risk to viability for each species/habitat relationship by alternative are presented in Table H - 2. To facilitate comparison of effects of alternatives on species viability, the number of Very High, High, and Moderately-High risk ratings are provided for each alternative by habitat element, forest rank, and species status. These codes can be found in three corresponding tables in the Terrestrial Species Evaluation section in Chapter 3.

### Table H – 2. Key to variables

#### Status

##### Code Description

- F Federally listed or proposed as Threatened or Endangered.
- S Regional Forester's Sensitive Species List.
- O Locally rare and other.

#### F Rank

##### Code Description

- F? Present on the forest, but abundance information is insufficient to develop rank.
- FO Not present, no known occurrences on the forest unit, and unit is outside the species range or habitat is not present.
- F1 Extremely rare on the forest unit, generally with 1-5 occurrences.
- F2 Very rare on the forest unit, generally with 6-20 occurrences.
- F3 Rare and uncommon on the forest unit, from 21-100 occurrences.
- F4 Widespread, abundant, and apparently secure on the forest unit.
- F5 Demonstrably secure on the forest unit.
- FP Possibly could occur on the forest unit, but documented occurrences not known.
- FH Of documented historical occurrence on the forest unit; may be rediscovered.
- FX Once occurred but has been extirpated from the forest unit; it is not likely to be rediscovered.

#### Viability Risk (see text for process used to define level of risk)

##### Code Description

- 1 Very High
- 2 High
- 3 Moderately High
- 4 Moderate
- 5 Low

**Table H - 2. Ratings of risk for each species/habitat relationship by alternative.**

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<b>Mammals</b>										
Clethrionomys gapperi maurus	Kentucky red-backed vole	O	F1	Mature Hemlock-White Pine	1	1	1	1	1	1
Clethrionomys gapperi maurus	Kentucky red-backed vole	O	F1	Downed Wood	2	3	3	3	3	2
Clethrionomys gapperi maurus	Kentucky red-backed vole	O	F1	Old Forests with Dead/Dying Large Trees	2	3	3	3	3	2
Clethrionomys gapperi maurus	Kentucky red-backed vole	O	F1	Water (distance sensitive)	3	3	3	3	3	3
Corynorhinus rafinesquii	Rafinesque's big-eared bat	S	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
Corynorhinus rafinesquii	Rafinesque's big-eared bat	S	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Corynorhinus rafinesquii	Rafinesque's big-eared bat	S	F3	Cliffline	5	5	5	5	5	5
Corynorhinus rafinesquii	Rafinesque's big-eared bat	S	F3	Mature Forest (general)	5	5	5	5	5	5
Corynorhinus rafinesquii	Rafinesque's big-eared bat	S	F3	Caves	4	4	4	4	4	4
Corynorhinus rafinesquii	Rafinesque's big-eared bat	S	F3	Mixed Forest Landscape	5	3	5	5	5	5
Corynorhinus rafinesquii	Rafinesque's big-eared bat	S	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Corynorhinus rafinesquii	Rafinesque's big-eared bat	S	F3	Old Forests with Dead/Dying Large Trees	4	5	5	5	5	4
Corynorhinus townsendii virginianus	Virginia big-eared bat	F	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Corynorhinus townsendii virginianus	Virginia big-eared bat	F	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
Corynorhinus townsendii virginianus	Virginia big-eared bat	F	F2	Mature Forest (general)	4	4	4	4	4	4
Corynorhinus townsendii virginianus	Virginia big-eared bat	F	F2	Caves	3	3	3	3	3	3
Corynorhinus townsendii virginianus	Virginia big-eared bat	F	F2	Grassland	2	2	2	2	2	2
Corynorhinus townsendii virginianus	Virginia big-eared bat	F	F2	Cliffline	4	4	4	4	4	4
Lontra canadensis	River otter	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
Lontra canadensis	River otter	O	F3	Water (distance sensitive)	5	5	5	5	5	5
Lontra canadensis	River otter	O	F3	Downed Wood	4	5	5	5	5	4
Myotis austroriparius	Southeastern bat	S	F?	Riparian (general)	3	3	3	3	3	3
Myotis austroriparius	Southeastern bat	S	F?	Caves	2	2	2	2	2	2
Myotis austroriparius	Southeastern bat	S	F?	Mature/old-aged Riparian Forest	3	3	3	3	3	3
Myotis grisescens	Gray bat	F	F?	Mature/old-aged Riparian Forest	3	3	3	3	3	3
Myotis grisescens	Gray bat	F	F?	Caves	2	2	2	2	2	2
Myotis grisescens	Gray bat	F	F?	Riparian (general)	3	3	3	3	3	3
Myotis leibii	Eastern small-footed bat	S	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
Myotis leibii	Eastern small-footed bat	S	F3	Mature Forest (general)	5	5	5	5	5	5
Myotis leibii	Eastern small-footed bat	S	F3	Cliffline	5	5	5	5	5	5
Myotis leibii	Eastern small-footed bat	S	F3	Riparian (general)	5	5	5	5	5	5
Myotis leibii	Eastern small-footed bat	S	F3	Caves	4	4	4	4	4	4
Myotis sodalis	Indiana bat	F	F3	Canopy Gaps	5	5	5	5	5	5
Myotis sodalis	Indiana bat	F	F3	Water (distance sensitive)	5	5	5	5	5	5
Myotis sodalis	Indiana bat	F	F3	Mature Forest (general)	5	5	5	5	5	5
Myotis sodalis	Indiana bat	F	F3	Caves	4	4	4	4	4	4
Myotis sodalis	Indiana bat	F	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
Myotis sodalis	Indiana bat	F	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Myotis sodalis	Indiana bat	F	F3	Early-aged Forest	5	3	5	5	5	5
Neotoma magister	Allegheny woodrat	O	F3	Caves	4	4	4	4	4	4
Neotoma magister	Allegheny woodrat	O	F3	Cliffline	5	5	5	5	5	5
Peromyscus maniculatus nubiterrae	Cloudland deer mouse	O	F1	Old Forests with Dead/Dying Large Trees	2	3	3	3	3	2
Peromyscus maniculatus nubiterrae	Cloudland deer mouse	O	F1	Downed Wood	2	3	3	3	3	2

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
Peromyscus maniculatus nubiterrae	Cloudland deer mouse	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
Peromyscus maniculatus nubiterrae	Cloudland deer mouse	O	F1	Mature Hemlock-White Pine	1	1	1	1	1	1
Sorex cinereus cinereus	Masked shrew	O	F1	Riparian (general)	3	3	3	3	3	3
Sorex cinereus cinereus	Masked shrew	O	F1	Mature Forest (general)	3	3	3	3	3	3
Sorex cinereus cinereus	Masked shrew	O	F1	Water (distance sensitive)	3	3	3	3	3	3
Sorex cinereus cinereus	Masked shrew	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
Sorex cinereus cinereus	Masked shrew	O	F1	Downed Wood	2	3	3	3	3	2
Sorex cinereus cinereus	Masked shrew	O	F1	Mature Hemlock-White Pine	1	1	1	1	1	1
Sorex dispar	Long-tailed shrew	O	F1	Riparian (general)	3	3	3	3	3	3
Sorex dispar	Long-tailed shrew	O	F1	Mature Hemlock-White Pine	1	1	1	1	1	1
Sorex dispar	Long-tailed shrew	O	F1	Old Forests with Dead/Dying Large Trees	2	3	3	3	3	2
Spilogale putorius	Spotted skunk	O	F3	Cliffline	5	5	5	5	5	5
Spilogale putorius	Spotted skunk	O	F3	Snags	4	5	5	5	5	4
Spilogale putorius	Spotted skunk	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Spilogale putorius	Spotted skunk	O	F3	Mature Forest (general)	5	5	5	5	5	5
Spilogale putorius	Spotted skunk	O	F3	Downed Wood	4	5	5	5	5	4
Sylvilagus obscurus	Appalachian cottontail	O	F3	Mature Hemlock-White Pine	3	3	3	3	3	3
Sylvilagus obscurus	Appalachian cottontail	O	F3	Mature Forest Interior	5	5	5	5	5	5
Sylvilagus obscurus	Appalachian cottontail	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Sylvilagus obscurus	Appalachian cottontail	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
Synaptomys cooperi	Southern bog lemming	O	F3	Grassland	3	3	3	3	3	3
Synaptomys cooperi	Southern bog lemming	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Synaptomys cooperi	Southern bog lemming	O	F3	Wetlands	3	3	3	3	3	3
Synaptomys cooperi	Southern bog lemming	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Synaptomys cooperi	Southern bog lemming	O	F3	Bogs, Springs, and Seeps	4	4	4	4	4	4
<b>Birds</b>										
Accipiter cooperii	Cooper's hawk	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
Accipiter cooperii	Cooper's hawk	O	F3	Mid-Aged Forest	5	5	5	5	5	5
Accipiter cooperii	Cooper's hawk	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
Accipiter cooperii	Cooper's hawk	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
Accipiter cooperii	Cooper's hawk	O	F3	Canopy Gaps	5	5	5	5	5	5
Accipiter cooperii	Cooper's hawk	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Accipiter striatus	Sharp-shinned hawk	O	F3	Mature Hemlock-White Pine	3	3	3	3	3	3
Accipiter striatus	Sharp-shinned hawk	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
Accipiter striatus	Sharp-shinned hawk	O	F3	Mature Forest Interior	5	5	5	5	5	5
Accipiter striatus	Sharp-shinned hawk	O	F3	Mature Forest (general)	5	5	5	5	5	5
Accipiter striatus	Sharp-shinned hawk	O	F3	Open Midstory and Understory	4	3	4	4	4	4
Accipiter striatus	Sharp-shinned hawk	O	F3	Old Forests with Dead/Dying Large Trees	4	5	5	5	5	4
Bombycilla cedrorum	Cedar waxwing	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
Bombycilla cedrorum	Cedar waxwing	O	F3	Mature Forest (general)	5	5	5	5	5	5
Bombycilla cedrorum	Cedar waxwing	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
Bombycilla cedrorum	Cedar waxwing	O	F3	Canopy Gaps	5	5	5	5	5	5
Bombycilla cedrorum	Cedar waxwing	O	F3	Open Midstory and Understory	4	3	4	4	4	4
Caprimulgus carolinensis	Chuck-wills-widow	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
Caprimulgus carolinensis	Chuck-wills-widow	O	F2	Open Midstory and Understory	3	2	3	3	3	3
Carpodacus purpureus	Purple finch	O	F3	Mature Forest Interior	5	5	5	5	5	5
Carpodacus purpureus	Purple finch	O	F3	Canopy Gaps	5	5	5	5	5	5
Catharus guttatus	Hermit thrush	O	F3	Open Midstory and Understory	4	3	4	4	4	4

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Catharus guttatus</i>	Hermit thrush	O	F3	Mature Hemlock-White Pine	3	3	3	3	3	3
<i>Catharus ustulatus</i>	Swainson's thrush	O	F?	Mature Forest Interior	3	3	3	3	3	3
<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo	O	F3	Early-aged Forest	5	3	5	5	5	5
<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo	O	F3	Mixed Forest Landscape	5	3	5	5	5	5
<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo	O	F3	Mature Forest Interior	5	5	5	5	5	5
<i>Coccyzus erythrophthalmus</i>	Black-billed cuckoo	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Colinus virginianus</i>	Northern bobwhite	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Colinus virginianus</i>	Northern bobwhite	O	F3	Early-aged Forest	5	3	5	5	5	5
<i>Colinus virginianus</i>	Northern bobwhite	O	F3	Grassland	3	3	3	3	3	3
<i>Colinus virginianus</i>	Northern bobwhite	O	F3	Grassland	3	3	3	3	3	3
<i>Colinus virginianus</i>	Northern bobwhite	O	F3	Mixed Forest Landscape	5	3	5	5	5	5
<i>Colinus virginianus</i>	Northern bobwhite	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Contopus borealis</i>	Olive-sided flycatcher	O	F?	Early-aged Forest	3	1	3	3	3	3
<i>Contopus borealis</i>	Olive-sided flycatcher	O	F?	Mature Hemlock-White Pine	1	1	1	1	1	1
<i>Contopus borealis</i>	Olive-sided flycatcher	O	F?	Mature Forest Interior	3	3	3	3	3	3
<i>Contopus borealis</i>	Olive-sided flycatcher	O	F?	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Contopus borealis</i>	Olive-sided flycatcher	O	F?	Dry-Xeric Cedar Oak	1	1	1	1	1	1
<i>Corvus corax</i>	Common raven	O	F1	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Corvus corax</i>	Common raven	O	F1	Mature Forest Interior	3	3	3	3	3	3
<i>Corvus corax</i>	Common raven	O	F1	Climifline	3	3	3	3	3	3
<i>Dendroica caerulescens</i>	Black-throated blue warbler	O	F?	Mixed Forest Landscape	3	1	3	3	3	3
<i>Dendroica caerulescens</i>	Black-throated blue warbler	O	F?	Dense High Shrub Understory	3	1	3	3	3	3
<i>Dendroica caerulescens</i>	Black-throated blue warbler	O	F?	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Dendroica cerulea</i>	Cerulean warbler	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Dendroica cerulea</i>	Cerulean warbler	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Dendroica cerulea</i>	Cerulean warbler	O	F3	Old Forests with Dead/Dying Large Trees	4	5	5	5	5	4
<i>Dendroica cerulea</i>	Cerulean warbler	O	F3	Mature Forest Interior	5	5	5	5	5	5
<i>Dendroica cerulea</i>	Cerulean warbler	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Dendroica cerulea</i>	Cerulean warbler	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
<i>Dendroica cerulea</i>	Cerulean warbler	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Dendroica cerulea</i>	Cerulean warbler	O	F3	Dense High Shrub Understory	5	3	5	5	5	5
<i>Dendroica cerulea</i>	Cerulean warbler	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Dendroica dominica</i>	Yellow-throated warbler	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Dendroica dominica</i>	Yellow-throated warbler	O	F3	Old Forests with Dead/Dying Large Trees	4	5	5	5	5	4
<i>Dendroica dominica</i>	Yellow-throated warbler	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Dendroica dominica</i>	Yellow-throated warbler	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Dendroica dominica</i>	Yellow-throated warbler	O	F3	Mature Forest Interior	5	5	5	5	5	5
<i>Dendroica fusca</i>	Blackburnian warbler	O	F?	Mature Hemlock-White Pine	1	1	1	1	1	1
<i>Dendroica fusca</i>	Blackburnian warbler	O	F?	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Dendroica fusca</i>	Blackburnian warbler	O	F?	Mature Forest (general)	3	3	3	3	3	3
<i>Dendroica fusca</i>	Blackburnian warbler	O	F?	Mature Forest Interior	3	3	3	3	3	3
<i>Dendroica fusca</i>	Blackburnian warbler	O	F?	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Dendroica magnolia</i>	Magnolia warbler	O	F?	Mature Hemlock-White Pine	1	1	1	1	1	1
<i>Dendroica pinus</i>	Pine warbler	O	F3	Mature Pitch Pine	3	3	3	3	3	3
<i>Dendroica pinus</i>	Pine warbler	O	F3	Fire Adapted/Enhanced	4	3	5	5	5	4
<i>Dendroica pinus</i>	Pine warbler	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Dendroica pinus</i>	Pine warbler	O	F3	Mature Forest Interior	5	5	5	5	5	5

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Dendroica pinus</i>	Pine warbler	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Dendroica pinus</i>	Pine warbler	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Dendroica pinus</i>	Pine warbler	O	F3	Mid-Aged Forest	5	5	5	5	5	5
<i>Dumetella carolinensis</i>	Gray catbird	O	F3	Early-aged Forest	5	3	5	5	5	5
<i>Dumetella carolinensis</i>	Gray catbird	O	F3	Grassland	3	3	3	3	3	3
<i>Dumetella carolinensis</i>	Gray catbird	O	F3	Mixed Forest Landscape	5	3	5	5	5	5
<i>Dumetella carolinensis</i>	Gray catbird	O	F3	Dense High Shrub Understory	5	3	5	5	5	5
<i>Dumetella carolinensis</i>	Gray catbird	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Empidonax alnorum</i>	Alder flycatcher	O	F?	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Empidonax alnorum</i>	Alder flycatcher	O	F?	Early-aged Forest	3	1	3	3	3	3
<i>Empidonax flaviventris</i>	Yellow-bellied flycatcher	O	F?	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Empidonax flaviventris</i>	Yellow-bellied flycatcher	O	F?	Mature Hemlock-White Pine	1	1	1	1	1	1
<i>Empidonax flaviventris</i>	Yellow-bellied flycatcher	O	F?	Mature Forest Interior	3	3	3	3	3	3
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Mature/old-aged Riparian Forest	3	3	3	3	3	3
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Fire Adapted/Enhanced	2	1	3	3	3	2
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Dry-Xeric Cedar Oak	1	1	1	1	1	1
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Canopy Gaps	3	3	3	3	3	3
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Grassland	1	1	1	1	1	1
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Early-aged Forest	3	1	3	3	3	3
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Mature Hemlock-White Pine	1	1	1	1	1	1
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Empidonax minimus</i>	Least flycatcher	O	F?	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Falco sparverius</i>	American kestrel	O	F3	Grassland	3	3	3	3	3	3
<i>Falco sparverius</i>	American kestrel	O	F3	Mature Forest Interior	5	5	5	5	5	5
<i>Falco sparverius</i>	American kestrel	O	F3	Mixed Forest Landscape	5	3	5	5	5	5
<i>Falco sparverius</i>	American kestrel	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Falco sparverius</i>	American kestrel	O	F3	Grassland	3	3	3	3	3	3
<i>Falco sparverius</i>	American kestrel	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Haliaeetus leucocephalus</i>	Bald eagle	F	F1	Water (distance sensitive)	3	3	3	3	3	3
<i>Haliaeetus leucocephalus</i>	Bald eagle	F	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Haliaeetus leucocephalus</i>	Bald eagle	F	F1	Mature Forest Interior	3	3	3	3	3	3
<i>Haliaeetus leucocephalus</i>	Bald eagle	F	F1	Pond Shore	2	2	2	2	2	2
<i>Haliaeetus leucocephalus</i>	Bald eagle	F	F1	Mature/old-aged Riparian Forest	3	3	3	3	3	3
<i>Haliaeetus leucocephalus</i>	Bald eagle	F	F1	Lakeshores, large reservoirs	2	2	2	2	2	2
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Canebrakes	2	2	2	2	2	2
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Mature Hemlock-White Pine	2	2	2	2	2	2
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Early-aged Riparian Forest	4	2	2	2	2	2
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Dense High Shrub Understory	4	2	4	4	4	4
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Mature/old-aged Riparian Forest	4	4	4	4	4	4
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	Mid-Aged Forest	4	4	4	4	4	4
<i>Limnothlypis swainsonii</i>	Swainson's warbler	O	F2	River Channels	4	4	4	4	4	4
<i>Loxia curvirostra</i>	Red crossbill	O	F?	Mature Hemlock-White Pine	1	1	1	1	1	1



Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Loxia curvirostra</i>	Red crossbill	O	F?	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Melospiza georgiana</i>	Swamp sparrow	O	F3	Grassland	3	3	3	3	3	3
<i>Oporornis philadelphia</i>	Mourning warbler	O	F?	Mature Forest Interior	3	3	3	3	3	3
<i>Oporornis philadelphia</i>	Mourning warbler	O	F?	Early-aged Forest	3	1	3	3	3	3
<i>Passerculus sandwichensis</i>	Savannah sparrow	O	F?	Grassland	1	1	1	1	1	1
<i>Passerculus sandwichensis</i>	Savannah sparrow	O	F?	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Passerculus sandwichensis</i>	Savannah sparrow	O	F?	Grassland	1	1	1	1	1	1
<i>Pheucticus ludovicianus</i>	Rose-breasted grosbeak	O	F?	Mature Forest Interior	3	3	3	3	3	3
<i>Pheucticus ludovicianus</i>	Rose-breasted grosbeak	O	F?	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Pheucticus ludovicianus</i>	Rose-breasted grosbeak	O	F?	Canopy Gaps	3	3	3	3	3	3
<i>Pheucticus ludovicianus</i>	Rose-breasted grosbeak	O	F?	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Scolopax minor</i>	American woodcock	O	F3	Bogs, Springs, and Seeps	4	4	4	4	4	4
<i>Scolopax minor</i>	American woodcock	O	F3	Lakeshores, large reservoirs	4	4	4	4	4	4
<i>Scolopax minor</i>	American woodcock	O	F3	Pond Shore	4	4	4	4	4	4
<i>Scolopax minor</i>	American woodcock	O	F3	Early-aged Forest	5	3	5	5	5	5
<i>Scolopax minor</i>	American woodcock	O	F3	Mixed Forest Landscape	5	3	5	5	5	5
<i>Scolopax minor</i>	American woodcock	O	F3	Grassland	3	3	3	3	3	3
<i>Scolopax minor</i>	American woodcock	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
<i>Scolopax minor</i>	American woodcock	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Seiurus noveboracensis</i>	Northern waterthrush	O	F?	Wetlands	1	1	1	1	1	1
<i>Seiurus noveboracensis</i>	Northern waterthrush	O	F?	Mature Forest Interior	3	3	3	3	3	3
<i>Seiurus noveboracensis</i>	Northern waterthrush	O	F?	Mature/old-aged Riparian Forest	3	3	3	3	3	3
<i>Sitta canadensis</i>	Red-breasted nuthatch	O	F1	Snags	2	3	3	3	3	2
<i>Sitta canadensis</i>	Red-breasted nuthatch	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Sitta canadensis</i>	Red-breasted nuthatch	O	F1	Mature Hemlock-White Pine	1	1	1	1	1	1
<i>Sitta canadensis</i>	Red-breasted nuthatch	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Sitta canadensis</i>	Red-breasted nuthatch	O	F1	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Sphyrapicus varius appalachiensis</i>	Appalachian yellow-bellied sapsucker	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Sphyrapicus varius appalachiensis</i>	Appalachian yellow-bellied sapsucker	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Sphyrapicus varius appalachiensis</i>	Appalachian yellow-bellied sapsucker	O	F3	Mature Forest Interior	5	5	5	5	5	5
<i>Spizella pusilla</i>	Field sparrow	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Spizella pusilla</i>	Field sparrow	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Spizella pusilla</i>	Field sparrow	O	F3	Mixed Forest Landscape	5	3	5	5	5	5
<i>Spizella pusilla</i>	Field sparrow	O	F3	Early-aged Forest	5	3	5	5	5	5
<i>Spizella pusilla</i>	Field sparrow	O	F3	Grassland	3	3	3	3	3	3
<i>Spizella pusilla</i>	Field sparrow	O	F3	Grassland	3	3	3	3	3	3
<i>Vermivora pinus</i>	Blue-winged warbler	O	F3	Mixed Forest Landscape	5	3	5	5	5	5
<i>Vermivora pinus</i>	Blue-winged warbler	O	F3	Early-aged Forest	5	3	5	5	5	5
<i>Vermivora pinus</i>	Blue-winged warbler	O	F3	Dense High Shrub Understory	5	3	5	5	5	5
<i>Vermivora pinus</i>	Blue-winged warbler	O	F3	Mature Forest Interior	5	5	5	5	5	5
<i>Vermivora ruficapilla</i>	Nashville warbler	O	F?	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Vermivora ruficapilla</i>	Nashville warbler	O	F?	Mature Hemlock-White Pine	1	1	1	1	1	1
<i>Vermivora ruficapilla</i>	Nashville warbler	O	F?	Mixed Forest Landscape	3	1	3	3	3	3
<i>Vermivora ruficapilla</i>	Nashville warbler	O	F?	Dense High Shrub Understory	3	1	3	3	3	3
<i>Vireo gilvus</i>	Warbling vireo	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Vireo gilvus</i>	Warbling vireo	O	F2	Mature/old-aged Riparian Forest	4	4	4	4	4	4
<i>Vireo gilvus</i>	Warbling vireo	O	F2	Mature Hemlock-White Pine	2	2	2	2	2	2
<i>Vireo gilvus</i>	Warbling vireo	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
Vireo gilvus	Warbling vireo	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
Vireo gilvus	Warbling vireo	O	F2	Dry-Xeric Cedar Oak	2	2	2	2	2	2
Wilsonia canadensis	Canada warbler	O	F?	Dense High Shrub Understory	3	1	3	3	3	3
Wilsonia canadensis	Canada warbler	O	F?	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
Wilsonia canadensis	Canada warbler	O	F?	Mature Forest Interior	3	3	3	3	3	3
<b>Reptiles</b>										
Apalone spinifera spinifera	Eastern spiny softshell	O	F3	River Channels	5	5	5	5	5	5
Apalone spinifera spinifera	Eastern spiny softshell	O	F3	Lakeshores, large reservoirs	4	4	4	4	4	4
Cemophora coccinea copei	Northern scarlet snake	O	F2	Downed Wood	3	4	4	4	4	3
Cemophora coccinea copei	Northern scarlet snake	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Cemophora coccinea copei	Northern scarlet snake	O	F2	Mature Forest (general)	4	4	4	4	4	4
Crotalus horridus	Timber rattlesnake	O	F3	Wetlands	3	3	3	3	3	3
Crotalus horridus	Timber rattlesnake	O	F3	Mature Forest (general)	5	5	5	5	5	5
Crotalus horridus	Timber rattlesnake	O	F3	Cliffline	5	5	5	5	5	5
Elaphe guttata guttata	Corn snake	O	F2	Downed Wood	3	4	4	4	4	3
Elaphe guttata guttata	Corn snake	O	F2	Dense High Shrub Understory	4	2	4	4	4	4
Elaphe guttata guttata	Corn snake	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Elaphe guttata guttata	Corn snake	O	F2	Mixed Forest Landscape	4	2	4	4	4	4
Elaphe guttata guttata	Corn snake	O	F2	Grassland	2	2	2	2	2	2
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Downed Wood	3	4	4	4	4	3
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Mature/old-aged Riparian Forest	4	4	4	4	4	4
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Open Midstory and Understory	3	2	3	3	3	3
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Canopy Gaps	4	4	4	4	4	4
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Cliffline	4	4	4	4	4	4
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Mature Forest (general)	4	4	4	4	4	4
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Water (distance sensitive)	4	4	4	4	4	4
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Early-aged Forest	4	2	4	4	4	4
Eumeces anthracinus anthracinus	Northern coal skink	O	F2	Wetlands	2	2	2	2	2	2
Eumeces inexpectatus	Southeastern five-lined skink	O	F2	Canopy Gaps	4	4	4	4	4	4
Eumeces inexpectatus	Southeastern five-lined skink	O	F2	Mature Forest (general)	4	4	4	4	4	4
Eumeces inexpectatus	Southeastern five-lined skink	O	F2	Fire Adapted/Enhanced	3	2	4	4	4	3
Eumeces inexpectatus	Southeastern five-lined skink	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
Eumeces inexpectatus	Southeastern five-lined skink	O	F2	Downed Wood	3	4	4	4	4	3
Eumeces inexpectatus	Southeastern five-lined skink	O	F2	Mixed Forest Landscape	4	2	4	4	4	4
Eumeces inexpectatus	Southeastern five-lined skink	O	F2	Early-aged Forest	4	2	4	4	4	4
Eumeces inexpectatus	Southeastern five-lined skink	O	F2	Open Midstory and Understory	3	2	3	3	3	3

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Graptemys geographica</i>	Map turtle	O	F3	Downed Wood	4	5	5	5	5	4
<i>Graptemys geographica</i>	Map turtle	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Graptemys geographica</i>	Map turtle	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
<i>Lampropeltis triangulum elapsoides</i>	Scarlet kingsnake	O	F2	Downed Wood	3	4	4	4	4	3
<i>Lampropeltis triangulum elapsoides</i>	Scarlet kingsnake	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Ophisaurus attenuatus longicaudus</i>	Eastern slender glass lizard	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Ophisaurus attenuatus longicaudus</i>	Eastern slender glass lizard	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Ophisaurus attenuatus longicaudus</i>	Eastern slender glass lizard	O	F3	Water (distance sensitive)	5	5	5	5	5	5
<i>Ophisaurus attenuatus longicaudus</i>	Eastern slender glass lizard	O	F3	Mixed Forest Landscape	5	3	5	5	5	5
<i>Ophisaurus attenuatus longicaudus</i>	Eastern slender glass lizard	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Ophisaurus attenuatus longicaudus</i>	Eastern slender glass lizard	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Ophisaurus attenuatus longicaudus</i>	Eastern slender glass lizard	O	F3	Grassland	3	3	3	3	3	3
<i>Ophisaurus attenuatus longicaudus</i>	Eastern slender glass lizard	O	F3	Grassland	3	3	3	3	3	3
<i>Tantilla coronata</i>	Southeastern crowned snake	O	F2	Wetlands	2	2	2	2	2	2
<i>Tantilla coronata</i>	Southeastern crowned snake	O	F2	Canopy Gaps	4	4	4	4	4	4
<i>Tantilla coronata</i>	Southeastern crowned snake	O	F2	Downed Wood	3	4	4	4	4	3
<i>Tantilla coronata</i>	Southeastern crowned snake	O	F2	Riparian (general)	4	4	4	4	4	4
<i>Tantilla coronata</i>	Southeastern crowned snake	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Tantilla coronata</i>	Southeastern crowned snake	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Virginia valeriae valeriae</i>	Eastern earth snake	O	F3	Cliffline	5	5	5	5	5	5
<i>Virginia valeriae valeriae</i>	Eastern earth snake	O	F3	Grassland	3	3	3	3	3	3
<i>Virginia valeriae valeriae</i>	Eastern earth snake	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Virginia valeriae valeriae</i>	Eastern earth snake	O	F3	Downed Wood	4	5	5	5	5	4
<b>Amphibians</b>										
<i>Aneides aeneus</i>	Green salamander	O	F3	Downed Wood	4	5	5	5	5	4
<i>Aneides aeneus</i>	Green salamander	O	F3	Cliffline	5	5	5	5	5	5
<i>Aneides aeneus</i>	Green salamander	O	F3	Bogs, Springs, and Seeps	4	4	4	4	4	4
<i>Aneides aeneus</i>	Green salamander	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Aneides aeneus</i>	Green salamander	O	F3	Caves	4	4	4	4	4	4
<i>Aneides aeneus</i>	Green salamander	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Desmognathus ochrophaeus</i>	Mountain dusky salamander	O	F3	Bogs, Springs, and Seeps	4	4	4	4	4	4
<i>Desmognathus ochrophaeus</i>	Mountain dusky salamander	O	F3	Mature Hemlock-White Pine	3	3	3	3	3	3
<i>Hemidactylum scutatum</i>	Four-toed Salamander	O	F3	Bogs, Springs, and Seeps	4	4	4	4	4	4
<i>Hemidactylum scutatum</i>	Four-toed Salamander	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Hemidactylum scutatum</i>	Four-toed Salamander	O	F3	Pond Shore	4	4	4	4	4	4
<i>Plethodon ventralis</i>	Southern zigzag salamander	O	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Pseudotriton montanus</i>	Eastern mud salamander	O	F3	Wetlands	3	3	3	3	3	3
<i>Pseudotriton montanus</i>	Eastern mud salamander	O	F3	Bogs, Springs, and Seeps	4	4	4	4	4	4
<i>Pseudotriton montanus</i>	Eastern mud salamander	O	F3	Downed Wood	4	5	5	5	5	4
<i>Pseudotriton montanus</i>	Eastern mud salamander	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<b>Invertebrates</b>										
Anguispira kochi	Snail	O	F2	Old Forests with Dead/Dying Large Trees	3	4	4	4	4	3
Anguispira kochi	Snail	O	F2	Cliffline	4	4	4	4	4	4
Anguispira kochi	Snail	O	F2	Mature Forest (general)	4	4	4	4	4	4
Anguispira rugoderma	Rough anguispira	O	F1	Old Forests with Dead/Dying Large Trees	2	3	3	3	3	2
Anguispira rugoderma	Rough anguispira	O	F1	Mature Forest (general)	3	3	3	3	3	3
Anguispira rugoderma	Rough anguispira	O	F1	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
Anguispira rugoderma	Rough anguispira	O	F1	Downed Wood	2	3	3	3	3	2
Autochthon cellus	Golden-banded skipper	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Celastrina ebenina	Dusky azure	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Dryobius sexnotatus	Sixbanded longhorned beetle	O	F1	Old Forests with Dead/Dying Large Trees	2	3	3	3	3	2
Dryobius sexnotatus	Sixbanded longhorned beetle	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
Dryobius sexnotatus	Sixbanded longhorned beetle	O	F1	Mature/Old-aged Beech	1	2	2	2	2	2
Erora laeta	Early hairstreak	O	F1	Grassland	1	1	1	1	1	1
Erora laeta	Early hairstreak	O	F1	Canopy Gaps	3	3	3	3	3	3
Erora laeta	Early hairstreak	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
Erora laeta	Early hairstreak	O	F1	Open Midstory and Understory	2	1	2	2	2	2
Erora laeta	Early hairstreak	O	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
Erora laeta	Early hairstreak	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
Manophylax butleri	Cliff Caddisfly	S	F2	Cliffline	4	4	4	4	4	4
Manophylax butleri	Cliff Caddisfly	S	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
Manophylax butleri	Cliff Caddisfly	S	F2	Water (distance sensitive)	4	4	4	4	4	4
Manophylax butleri	Cliff Caddisfly	S	F2	River Channels	4	4	4	4	4	4
Manophylax butleri	Cliff Caddisfly	S	F2	Caves	3	3	3	3	3	3
Mesodon chilhoweensis	Queen crater	O	F2	Cliffline	4	4	4	4	4	4
Mesodon chilhoweensis	Queen crater	O	F2	Mature Forest (general)	4	4	4	4	4	4
Mesodon wetherbyi	Wrinkled Button	O	F2	Cliffline	4	4	4	4	4	4
Mesodon wetherbyi	Wrinkled Button	O	F2	Mature Forest (general)	4	4	4	4	4	4
Mesomphix rugeli	Wrinkled button	O	F2	Mature Forest (general)	4	4	4	4	4	4
Paravitrea placentula	Glossy supercoil	S	F1	Mature Forest (general)	3	3	3	3	3	3
Speyeria diana	Diana fritillary	S	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Speyeria diana	Diana fritillary	S	F3	Grassland	3	3	3	3	3	3
Speyeria diana	Diana fritillary	S	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Speyeria diana	Diana fritillary	S	F3	Canopy Gaps	5	5	5	5	5	5
Speyeria diana	Diana fritillary	S	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
Speyeria diana	Diana fritillary	S	F3	Early-aged Forest	5	3	5	5	5	5
Speyeria diana	Diana fritillary	S	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
Speyeria diana	Diana fritillary	S	F3	Mixed Forest Landscape	5	3	5	5	5	5
Speyeria diana	Diana fritillary	S	F3	Grassland	3	3	3	3	3	3
Speyeria diana	Diana fritillary	S	F3	Mature Forest (general)	5	5	5	5	5	5
Speyeria diana	Diana fritillary	S	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Speyeria diana	Diana fritillary	S	F3	Fire Adapted/Enhanced	4	3	5	5	5	4
Speyeria diana	Diana fritillary	S	F3	Open Midstory and Understory	4	3	4	4	4	4
Speyeria diana	Diana fritillary	S	F3	Riparian (general)	5	5	5	5	5	5
Vertigo gouldi	Land snail	O	F?	Mixed Mesophytic Hardwood	3	3	3	3	3	3
Vitrinizonites latissimus	Glossy grapeskin	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
Vitrinizonites latissimus	Glossy grapeskin	O	F1	Cliffline	3	3	3	3	3	3

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<b>Vascular Plants</b>										
<i>Acer pensylvanicum</i>	Striped maple	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Acer pensylvanicum</i>	Striped maple	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Acer spicatum</i>	Mountain maple	O	F1	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Acer spicatum</i>	Mountain maple	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Aconitum uncinatum</i>	Blue monkshood	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Aconitum uncinatum</i>	Blue monkshood	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Aconitum uncinatum</i>	Blue monkshood	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Aconitum uncinatum</i>	Blue monkshood	O	F1	Riparian (general)	3	3	3	3	3	3
<i>Agastache scrophulariifolia</i>	Giant purple hyssop	O	F2	Canopy Gaps	4	4	4	4	4	4
<i>Agastache scrophulariifolia</i>	Giant purple hyssop	O	F2	Grassland	2	2	2	2	2	2
<i>Agastache scrophulariifolia</i>	Giant purple hyssop	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
<i>Agastache scrophulariifolia</i>	Giant purple hyssop	O	F2	Mature Forest Interior	4	4	4	4	4	4
<i>Agave virginica</i>	Wild agave	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Agave virginica</i>	Wild agave	O	F3	Glades and Prairies	3	3	3	3	3	3
<i>Agave virginica</i>	Wild agave	O	F3	Cliffline	5	5	5	5	5	5
<i>Allium burdickii</i>	Narrowleaf ramps	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Allium burdickii</i>	Narrowleaf ramps	O	F2	Open Midstory and Understory	3	2	3	3	3	3
<i>Allium burdickii</i>	Narrowleaf ramps	O	F2	Riparian (general)	4	4	4	4	4	4
<i>Aster concolor</i>	Eastern silvery aster	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
<i>Aster concolor</i>	Eastern silvery aster	O	F2	Grassland	2	2	2	2	2	2
<i>Aster concolor</i>	Eastern silvery aster	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Aster laevis</i> var. <i>concinus</i>	Smooth purple aster	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Aster laevis</i> var. <i>concinus</i>	Smooth purple aster	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Aster laevis</i> var. <i>concinus</i>	Smooth purple aster	O	F3	Grassland	3	3	3	3	3	3
<i>Aster laevis</i> var. <i>concinus</i>	Smooth purple aster	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Aster laevis</i> var. <i>laevis</i>	Smooth blue aster	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Aster laevis</i> var. <i>laevis</i>	Smooth blue aster	O	F3	Glades and Prairies	3	3	3	3	3	3
<i>Aster laevis</i> var. <i>laevis</i>	Smooth blue aster	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Aster laevis</i> var. <i>laevis</i>	Smooth blue aster	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Aster laevis</i> var. <i>laevis</i>	Smooth blue aster	O	F3	Grassland	3	3	3	3	3	3
<i>Aster oblongifolius</i>	Aromatic aster	O	F2	Canopy Gaps	4	4	4	4	4	4
<i>Aster oblongifolius</i>	Aromatic aster	O	F2	Open Midstory and Understory	3	2	3	3	3	3
<i>Aster oblongifolius</i>	Aromatic aster	O	F2	Cliffline	4	4	4	4	4	4
<i>Aster oblongifolius</i>	Aromatic aster	O	F2	Glades and Prairies	2	2	2	2	2	2
<i>Aster saxicastellii</i>	Rockcastle aster	S	F1	Early-aged Forest	3	1	3	3	3	3
<i>Aster saxicastellii</i>	Rockcastle aster	S	F1	Canopy Gaps	3	3	3	3	3	3
<i>Aster saxicastellii</i>	Rockcastle aster	S	F1	River Channels	3	3	3	3	3	3
<i>Athyrium pycnocarpon</i>	Narrow-leaved glade fern	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Aureolaria patula</i>	Spreading yellow false foxglove	S	F1	River Channels	3	3	3	3	3	3
<i>Baptisia australis</i>	Blue wild indigo	O	F3	River Channels	5	5	5	5	5	5
<i>Baptisia australis</i>	Blue wild indigo	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Bartonia virginica</i>	Yellow screwstem	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Bartonia virginica</i>	Yellow screwstem	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Bartonia virginica</i>	Yellow screwstem	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Betula alleghaniensis</i>	Yellow birch	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Bouteloua curtipendula</i>	Side-oats grama	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Bouteloua curtipendula</i>	Side-oats grama	O	F1	Fire Adapted/Enhanced	2	1	3	3	3	2
<i>Bouteloua curtipendula</i>	Side-oats grama	O	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Bouteloua curtipendula</i>	Side-oats grama	O	F1	Grassland	1	1	1	1	1	1
<i>Bouteloua curtipendula</i>	Side-oats grama	O	F1	Open Midstory and Understory	2	1	2	2	2	2

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
Buchnera americana	American bluehearts	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
Buchnera americana	American bluehearts	O	F1	Grassland	1	1	1	1	1	1
Calamagrostis porteri	Porter's reedgrass	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
Calamagrostis porteri	Porter's reedgrass	O	F1	Cliffline	3	3	3	3	3	3
Calopogon tuberosus	Grass pink	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
Calopogon tuberosus	Grass pink	O	F1	Canopy Gaps	3	3	3	3	3	3
Calopogon tuberosus	Grass pink	O	F1	Grassland	1	1	1	1	1	1
Calopogon tuberosus	Grass pink	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
Calycanthus floridus var. glaucus	Sweet shrub	O	F2	Mixed Forest Landscape	4	2	4	4	4	4
Calycanthus floridus var. glaucus	Sweet shrub	O	F2	Mature Forest (general)	4	4	4	4	4	4
Calycanthus floridus var. glaucus	Sweet shrub	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
Calycanthus floridus var. glaucus	Sweet shrub	O	F2	River Channels	4	4	4	4	4	4
Camassia scilloides	Wild hyacinth	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Camassia scilloides	Wild hyacinth	O	F2	Grassland	2	2	2	2	2	2
Camassia scilloides	Wild hyacinth	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Cardamine rotundifolia	Round-leaved watercress	O	F?	Mature Forest (general)	3	3	3	3	3	3
Cardamine rotundifolia	Round-leaved watercress	O	F?	River Channels	3	3	3	3	3	3
Cardamine rotundifolia	Round-leaved watercress	O	F?	Wetlands	1	1	1	1	1	1
Cardamine rotundifolia	Round-leaved watercress	O	F?	Mature/old-aged Riparian Forest	3	3	3	3	3	3
Cardamine rotundifolia	Round-leaved watercress	O	F?	Bogs, Springs, and Seeps	2	2	2	2	2	2
Carex appalachica	Appalachian sedge	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
Carex appalachica	Appalachian sedge	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
Carex appalachica	Appalachian sedge	O	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
Carex gracillima	Graceful sedge	O	F3	Canopy Gaps	5	5	5	5	5	5
Carex gracillima	Graceful sedge	O	F3	Grassland	3	3	3	3	3	3
Carex gracillima	Graceful sedge	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
Carex gracillima	Graceful sedge	O	F3	Mature Hemlock-White Pine	3	3	3	3	3	3
Carex gracillima	Graceful sedge	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Carex joorii	Cypress-swamp sedge	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
Carex joorii	Cypress-swamp sedge	O	F1	Mature Forest (general)	3	3	3	3	3	3
Carex joorii	Cypress-swamp sedge	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
Carex picta	Doughnut caric sedge	O	F3	Canopy Gaps	5	5	5	5	5	5
Carex picta	Doughnut caric sedge	O	F3	Fire Adapted/Enhanced	4	3	5	5	5	4
Carex picta	Doughnut caric sedge	O	F3	Mature Forest (general)	5	5	5	5	5	5
Carex picta	Doughnut caric sedge	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
Carex picta	Doughnut caric sedge	O	F3	Open Midstory and Understory	4	3	4	4	4	4
Carex purpurifera	Purple sedge	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Carex purpurifera	Purple sedge	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
Carex purpurifera	Purple sedge	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Carex purpurifera	Purple sedge	O	F3	Dry-Xeric Cedar Oak	3	3	3	3	3	3
Carex seorsa	Bog caric sedge	O	F2	Mature Forest (general)	4	4	4	4	4	4
Carex seorsa	Bog caric sedge	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
Carex seorsa	Bog caric sedge	O	F2	Mature/old-aged Riparian Forest	4	4	4	4	4	4
Carex seorsa	Bog caric sedge	O	F2	Wetlands	2	2	2	2	2	2
Carex stricta	Tussock caric sedge	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
Carex stricta	Tussock caric sedge	O	F1	Wetlands	1	1	1	1	1	1
Carex stricta	Tussock caric sedge	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Carex stricta</i>	Tussock caric sedge	O	F1	Grassland	1	1	1	1	1	1
<i>Castanea dentata</i>	American chestnut	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Castanea dentata</i>	American chestnut	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Castanea dentata</i>	American chestnut	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Castanea pumila</i> var. <i>pumila</i>	Allegheny chinkapin	O	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Castanea pumila</i> var. <i>pumila</i>	Allegheny chinkapin	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Castanea pumila</i> var. <i>pumila</i>	Allegheny chinkapin	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Castanea pumila</i> var. <i>pumila</i>	Allegheny chinkapin	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Ceanothus herbaceus</i>	Prairie redroot	O	F2	River Channels	4	4	4	4	4	4
<i>Ceanothus herbaceus</i>	Prairie redroot	O	F2	Grassland	2	2	2	2	2	2
<i>Chrysosplenium americanum</i>	Golden saxifrage	O	F1	River Channels	3	3	3	3	3	3
<i>Chrysosplenium americanum</i>	Golden saxifrage	O	F1	Pond Shore	2	2	2	2	2	2
<i>Cimicifuga americana</i>	Mountain Bugbane	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Cimicifuga americana</i>	Mountain Bugbane	O	F2	Cliffline	4	4	4	4	4	4
<i>Circaea alpina</i> ssp. <i>alpina</i>	Small enchanter's nightshade	O	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Circaea alpina</i> ssp. <i>alpina</i>	Small enchanter's nightshade	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Circaea alpina</i> ssp. <i>alpina</i>	Small enchanter's nightshade	O	F2	Mature Hemlock-White Pine	2	2	2	2	2	2
<i>Cirsium carolinianum</i>	Carolina thistle	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Cirsium carolinianum</i>	Carolina thistle	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Cirsium carolinianum</i>	Carolina thistle	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Cirsium carolinianum</i>	Carolina thistle	O	F3	Fire Adapted/Enhanced	4	3	5	5	5	4
<i>Cirsium carolinianum</i>	Carolina thistle	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Cirsium carolinianum</i>	Carolina thistle	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Cladrastis kentukea</i>	Yellowwood	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Cladrastis kentukea</i>	Yellowwood	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Cladrastis kentukea</i>	Yellowwood	O	F3	Cliffline	5	5	5	5	5	5
<i>Cleistes bifaria</i>	Small spreading pogonia	S	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Cleistes bifaria</i>	Small spreading pogonia	S	F2	Wetlands	2	2	2	2	2	2
<i>Cleistes bifaria</i>	Small spreading pogonia	S	F2	Grassland	2	2	2	2	2	2
<i>Cleistes bifaria</i>	Small spreading pogonia	S	F2	Open Midstory and Understory	3	2	3	3	3	3
<i>Cleistes bifaria</i>	Small spreading pogonia	S	F2	Canopy Gaps	4	4	4	4	4	4
<i>Cleistes bifaria</i>	Small spreading pogonia	S	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Cleistes bifaria</i>	Small spreading pogonia	S	F2	Grassland	2	2	2	2	2	2
<i>Cleistes bifaria</i>	Small spreading pogonia	S	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
<i>Cleistes bifaria</i>	Small spreading pogonia	S	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
<i>Clematis glaucophylla</i>	White-leaved leather flower	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Clematis glaucophylla</i>	White-leaved leather flower	O	F3	Grassland	3	3	3	3	3	3
<i>Clematis glaucophylla</i>	White-leaved leather flower	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Collinsia verna</i>	Eastern blue-eyed Mary	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Comptonia peregrina</i>	Sweet fern	O	F1	River Channels	3	3	3	3	3	3
<i>Comptonia peregrina</i>	Sweet fern	O	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Comptonia peregrina</i>	Sweet fern	O	F1	Grassland	1	1	1	1	1	1
<i>Comptonia peregrina</i>	Sweet fern	O	F1	Grassland	1	1	1	1	1	1
<i>Comptonia peregrina</i>	Sweet fern	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Comptonia peregrina</i>	Sweet fern	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Comptonia peregrina</i>	Sweet fern	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Comptonia peregrina</i>	Sweet fern	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Crataegus calpodendron</i>	Pear hawthorne	O	F?	Riparian (general)	3	3	3	3	3	3
<i>Crataegus calpodendron</i>	Pear hawthorne	O	F?	Mature Forest (general)	3	3	3	3	3	3
<i>Crataegus calpodendron</i>	Pear hawthorne	O	F?	River Channels	3	3	3	3	3	3
<i>Crataegus calpodendron</i>	Pear hawthorne	O	F?	Canopy Gaps	3	3	3	3	3	3
<i>Croton monanthogynus</i>	Prarie-tea croton	O	F2	Grassland	2	2	2	2	2	2
<i>Croton monanthogynus</i>	Prarie-tea croton	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
<i>Croton monanthogynus</i>	Prarie-tea croton	O	F2	Cliffline	4	4	4	4	4	4
<i>Cypripedium kentuckiense</i>	Southern lady's slipper	S	F2	Canopy Gaps	4	4	4	4	4	4
<i>Cypripedium kentuckiense</i>	Southern lady's slipper	S	F2	River Channels	4	4	4	4	4	4
<i>Cypripedium kentuckiense</i>	Southern lady's slipper	S	F2	Mature/old-aged Riparian Forest	4	4	4	4	4	4
<i>Cypripedium parviflorum</i> var. <i>parviflorum</i>	Small yellow lady's slipper	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Cypripedium parviflorum</i> var. <i>parviflorum</i>	Small yellow lady's slipper	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Cypripedium parviflorum</i> var. <i>parviflorum</i>	Small yellow lady's slipper	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Cypripedium parviflorum</i> var. <i>parviflorum</i>	Small yellow lady's slipper	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Cystopteris protrusa</i>	Lowland brittlefern	O	F?	Mature Forest (general)	3	3	3	3	3	3
<i>Cystopteris tennesseensis</i>	Tennessee bladder-fern	O	F?	Cliffline	3	3	3	3	3	3
<i>Cystopteris tennesseensis</i>	Tennessee bladder-fern	O	F?	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Desmodium sessilifolium</i>	Sessile-leaf tick-trefoil	O	F2	Open Midstory and Understory	3	2	3	3	3	3
<i>Desmodium sessilifolium</i>	Sessile-leaf tick-trefoil	O	F2	Grassland	2	2	2	2	2	2
<i>Desmodium sessilifolium</i>	Sessile-leaf tick-trefoil	O	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Desmodium sessilifolium</i>	Sessile-leaf tick-trefoil	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
<i>Desmodium sessilifolium</i>	Sessile-leaf tick-trefoil	O	F2	Canopy Gaps	4	4	4	4	4	4
<i>Diphasiastrum tristachyum</i>	Ground cedar	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Diphasiastrum tristachyum</i>	Ground cedar	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Dirca palustris</i>	Leatherwood	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
<i>Dirca palustris</i>	Leatherwood	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Dodecatheon frenchii</i>	French's shooting star	S	F1	Caves	2	2	2	2	2	2
<i>Dodecatheon meadia</i> ssp. <i>meadia</i>	Eastern shooting star	O	F3	Cliffline	5	5	5	5	5	5
<i>Dodecatheon meadia</i> ssp. <i>meadia</i>	Eastern shooting star	O	F3	Grassland	3	3	3	3	3	3
<i>Dodecatheon meadia</i> ssp. <i>meadia</i>	Eastern shooting star	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Dryopteris carthusiana</i>	Spinulose shield fern	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Dryopteris goldiana</i>	Goldie's woodfern	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Echinacea purpurea</i>	Purple coneflower	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Echinacea purpurea</i>	Purple coneflower	O	F3	Fire Adapted/Enhanced	4	3	5	5	5	4
<i>Echinacea purpurea</i>	Purple coneflower	O	F3	Grassland	3	3	3	3	3	3
<i>Echinacea purpurea</i>	Purple coneflower	O	F3	Mature Forest Interior	5	5	5	5	5	5
<i>Echinacea purpurea</i>	Purple coneflower	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Echinacea purpurea</i>	Purple coneflower	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Epilobium ciliatum</i>	Hair willow-herb	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Epilobium ciliatum</i>	Hair willow-herb	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Eriophorum virginicum</i>	Tawny cotton-grass	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Eriophorum virginicum</i>	Tawny cotton-grass	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Eryngium yuccifolium</i>	Rattlesnake-master	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Eryngium yuccifolium</i>	Rattlesnake-master	O	F1	Wetlands	1	1	1	1	1	1
<i>Eryngium yuccifolium</i>	Rattlesnake-master	O	F1	Canopy Gaps	3	3	3	3	3	3



Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Eryngium yuccifolium</i>	Rattlesnake-master	O	F1	Grassland	1	1	1	1	1	1
<i>Eupatorium incarnatum</i>	Pink thoroughwort	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
<i>Eupatorium incarnatum</i>	Pink thoroughwort	O	F2	Wetlands	2	2	2	2	2	2
<i>Eupatorium incarnatum</i>	Pink thoroughwort	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Eupatorium incarnatum</i>	Pink thoroughwort	O	F2	Grassland	2	2	2	2	2	2
<i>Eupatorium semiserratum</i>	Eupatorium	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Eupatorium semiserratum</i>	Eupatorium	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Eupatorium semiserratum</i>	Eupatorium	O	F1	Wetlands	1	1	1	1	1	1
<i>Eupatorium semiserratum</i>	Eupatorium	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Eupatorium semiserratum</i>	Eupatorium	O	F1	Riparian (general)	3	3	3	3	3	3
<i>Euphorbia commutata</i>	Cliff spurge	O	F?	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Gaylussacia brachycera</i>	Box huckleberry	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Gaylussacia brachycera</i>	Box huckleberry	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Gaylussacia brachycera</i>	Box huckleberry	O	F3	Cliffline	5	5	5	5	5	5
<i>Gaylussacia brachycera</i>	Box huckleberry	O	F3	Glades and Prairies	3	3	3	3	3	3
<i>Gaylussacia brachycera</i>	Box huckleberry	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Gaylussacia brachycera</i>	Box huckleberry	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Gaylussacia brachycera</i>	Box huckleberry	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Gratiola pilosa</i>	Shaggy hedge hyssop	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Gratiola pilosa</i>	Shaggy hedge hyssop	O	F1	Pond Shore	2	2	2	2	2	2
<i>Gratiola pilosa</i>	Shaggy hedge hyssop	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Hackelia virginiana</i>	Virginia stickseed	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Hackelia virginiana</i>	Virginia stickseed	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Hackelia virginiana</i>	Virginia stickseed	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Hackelia virginiana</i>	Virginia stickseed	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Hackelia virginiana</i>	Virginia stickseed	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Helianthus atrorubens</i>	Savanna hairy sunflower	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Helianthus atrorubens</i>	Savanna hairy sunflower	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Helianthus atrorubens</i>	Savanna hairy sunflower	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Helianthus atrorubens</i>	Savanna hairy sunflower	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Heracleum maximum</i>	Cow parsnip	O	F1	River Channels	3	3	3	3	3	3
<i>Heracleum maximum</i>	Cow parsnip	O	F1	Grassland	1	1	1	1	1	1
<i>Heuchera longiflora</i>	Long-flowered alumroot	O	F?	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Hexalectris spicata</i>	Crested coral root	O	F2	Open Midstory and Understory	3	2	3	3	3	3
<i>Hexalectris spicata</i>	Crested coral root	O	F2	Cliffline	4	4	4	4	4	4
<i>Hexalectris spicata</i>	Crested coral root	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Hexastylis contracta</i>	Mountain heartleaf	S	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Hexastylis contracta</i>	Mountain heartleaf	S	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Hieracium scabrum</i>	Rough hawkweed	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Hieracium scabrum</i>	Rough hawkweed	O	F1	Grassland	1	1	1	1	1	1
<i>Hieracium scabrum</i>	Rough hawkweed	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Hieracium scabrum</i>	Rough hawkweed	O	F1	Open Midstory and Understory	2	1	2	2	2	2
<i>Hieracium scabrum</i>	Rough hawkweed	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Hydrastis canadensis</i>	Goldenseal	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Hydrastis canadensis</i>	Goldenseal	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Hydrastis canadensis</i>	Goldenseal	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Hydrastis canadensis</i>	Goldenseal	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
<i>Hydrastis canadensis</i>	Goldenseal	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Hydrastis canadensis</i>	Goldenseal	O	F3	River Channels	5	5	5	5	5	5
<i>Hydrocotyle americana</i>	American pennywort	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Hydrocotyle americana</i>	American pennywort	O	F1	River Channels	3	3	3	3	3	3

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Hydrocotyle americana</i>	American pennywort	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Hydrocotyle americana</i>	American pennywort	O	F1	Wetlands	1	1	1	1	1	1
<i>Hypericum crux-andreae</i>	St. Peter's-wort	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Hypericum crux-andreae</i>	St. Peter's-wort	O	F1	Grassland	1	1	1	1	1	1
<i>Hypericum crux-andreae</i>	St. Peter's-wort	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Isoetes englemannii</i>	Quillwort	O	F3	Pond Shore	4	4	4	4	4	4
<i>Isoetes englemannii</i>	Quillwort	O	F3	Lakeshores, large reservoirs	4	4	4	4	4	4
<i>Isoetes englemannii</i>	Quillwort	O	F3	Bogs, Springs, and Seeps	4	4	4	4	4	4
<i>Isoetes englemannii</i>	Quillwort	O	F3	Grassland	3	3	3	3	3	3
<i>Isoetes englemannii</i>	Quillwort	O	F3	Wetlands	3	3	3	3	3	3
<i>Isotria verticillata</i>	Large whorled pagonia	O	F3	Mature Hemlock-White Pine	3	3	3	3	3	3
<i>Isotria verticillata</i>	Large whorled pagonia	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Isotria verticillata</i>	Large whorled pagonia	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Isotria verticillata</i>	Large whorled pagonia	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Isotria verticillata</i>	Large whorled pagonia	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Isotria verticillata</i>	Large whorled pagonia	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Juglans cinerea</i>	Butternut	S	F2	Mature/old-aged Riparian Forest	4	4	4	4	4	4
<i>Juglans cinerea</i>	Butternut	S	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Juglans cinerea</i>	Butternut	S	F2	Riparian (general)	4	4	4	4	4	4
<i>Juncus articulatus</i>	Jointed rush	O	F2	Grassland	2	2	2	2	2	2
<i>Juncus articulatus</i>	Jointed rush	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
<i>Juncus articulatus</i>	Jointed rush	O	F2	River Channels	4	4	4	4	4	4
<i>Juncus articulatus</i>	Jointed rush	O	F2	Lakeshores, large reservoirs	3	3	3	3	3	3
<i>Juniperus communis</i> var. <i>depressa</i>	Ground juniper	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Juniperus communis</i> var. <i>depressa</i>	Ground juniper	O	F2	Cliffline	4	4	4	4	4	4
<i>Lathyrus palustris</i>	Vetchling peavine	O	F1	Riparian (general)	3	3	3	3	3	3
<i>Lathyrus palustris</i>	Vetchling peavine	O	F1	Mature/old-aged Riparian Forest	3	3	3	3	3	3
<i>Lathyrus palustris</i>	Vetchling peavine	O	F1	Grassland	1	1	1	1	1	1
<i>Lathyrus palustris</i>	Vetchling peavine	O	F1	River Channels	3	3	3	3	3	3
<i>Lathyrus palustris</i>	Vetchling peavine	O	F1	Lakeshores, large reservoirs	2	2	2	2	2	2
<i>Lathyrus venosus</i>	Smooth veiny peavine	O	F1	River Channels	3	3	3	3	3	3
<i>Lathyrus venosus</i>	Smooth veiny peavine	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Lathyrus venosus</i>	Smooth veiny peavine	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Lathyrus venosus</i>	Smooth veiny peavine	O	F1	Mature/old-aged Riparian Forest	3	3	3	3	3	3
<i>Lathyrus venosus</i>	Smooth veiny peavine	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Lathyrus venosus</i>	Smooth veiny peavine	O	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Liatris aspera</i>	Rough blazing star	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Liatris aspera</i>	Rough blazing star	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Liatris aspera</i>	Rough blazing star	O	F3	Grassland	3	3	3	3	3	3
<i>Liatris aspera</i>	Rough blazing star	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Liatris microcephala</i>	Small-head blazing star	O	F3	Glades and Prairies	3	3	3	3	3	3
<i>Liatris microcephala</i>	Small-head blazing star	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Liatris microcephala</i>	Small-head blazing star	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Liatris microcephala</i>	Small-head blazing star	O	F3	Cliffline	5	5	5	5	5	5
<i>Liatris squarrulosa</i>	Earle's blazing star	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Liatris squarrulosa</i>	Earle's blazing star	O	F1	Grassland	1	1	1	1	1	1
<i>Liatris squarrulosa</i>	Earle's blazing star	O	F1	Open Midstory and Understory	2	1	2	2	2	2
<i>Liatris squarrulosa</i>	Earle's blazing star	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Liatris squarrulosa</i>	Earle's blazing star	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Lilium canadense</i> ssp. <i>canadense</i>	Yellow Canada lily	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Lilium canadense</i> ssp. <i>canadense</i>	Yellow Canada lily	O	F3	Grassland	3	3	3	3	3	3
<i>Lilium canadense</i> ssp. <i>canadense</i>	Yellow Canada lily	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
<i>Lilium canadense</i> ssp. <i>canadense</i>	Yellow Canada lily	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Lilium canadense</i> ssp. <i>canadense</i>	Yellow Canada lily	O	F3	River Channels	5	5	5	5	5	5
<i>Lilium canadense</i> ssp. <i>canadense</i>	Yellow Canada lily	O	F3	Mixed Forest Landscape	5	3	5	5	5	5
<i>Lilium philadelphicum</i> var. <i>philadelphicum</i>	Wood lily	O	F2	Canopy Gaps	4	4	4	4	4	4
<i>Lilium philadelphicum</i> var. <i>philadelphicum</i>	Wood lily	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
<i>Lilium philadelphicum</i> var. <i>philadelphicum</i>	Wood lily	O	F2	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	2	2	2	2	2	2
<i>Lilium philadelphicum</i> var. <i>philadelphicum</i>	Wood lily	O	F2	Grassland	2	2	2	2	2	2
<i>Lilium philadelphicum</i> var. <i>philadelphicum</i>	Wood lily	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
<i>Lilium philadelphicum</i> var. <i>philadelphicum</i>	Wood lily	O	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Lilium philadelphicum</i> var. <i>philadelphicum</i>	Wood lily	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Liparis loeselii</i>	Loesel's twayblade	O	F2	Grassland	2	2	2	2	2	2
<i>Liparis loeselii</i>	Loesel's twayblade	O	F2	Cliffline	4	4	4	4	4	4
<i>Liparis loeselii</i>	Loesel's twayblade	O	F2	River Channels	4	4	4	4	4	4
<i>Liparis loeselii</i>	Loesel's twayblade	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Liparis loeselii</i>	Loesel's twayblade	O	F2	Pond Shore	3	3	3	3	3	3
<i>Liparis loeselii</i>	Loesel's twayblade	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
<i>Lobelia nuttallii</i>	Nuttall's lobelia	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Lobelia nuttallii</i>	Nuttall's lobelia	O	F1	Mature/old-aged Riparian Forest	3	3	3	3	3	3
<i>Lobelia nuttallii</i>	Nuttall's lobelia	O	F1	Grassland	1	1	1	1	1	1
<i>Lonicera flava</i>	Yellow honeysuckle	O	F?	Early-aged Forest	3	1	3	3	3	3
<i>Lonicera flava</i>	Yellow honeysuckle	O	F?	Mature Forest (general)	3	3	3	3	3	3
<i>Lycopodiella appressa</i>	Bog clubmoss	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Lycopodiella appressa</i>	Bog clubmoss	O	F1	Cliffline	3	3	3	3	3	3
<i>Lycopodium clavatum</i>	Ground pine	O	F1	Mature Hemlock-White Pine	1	1	1	1	1	1
<i>Lycopodium clavatum</i>	Ground pine	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Lysimachia fraseri</i>	Fraser's loosestrife	S	F1	Grassland	1	1	1	1	1	1
<i>Lysimachia fraseri</i>	Fraser's loosestrife	S	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Lysimachia fraseri</i>	Fraser's loosestrife	S	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Maianthemum canadense</i>	Wild lily-of-the-valley	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Maianthemum canadense</i>	Wild lily-of-the-valley	O	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Maianthemum canadense</i>	Wild lily-of-the-valley	O	F2	Mature Hemlock-White Pine	2	2	2	2	2	2
<i>Maianthemum canadense</i>	Wild lily-of-the-valley	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
<i>Melanthium parviflorum</i>	Small-flowered false hellebore	O	F1	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Melanthium parviflorum</i>	Small-flowered false hellebore	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Melanthium parviflorum</i>	Small-flowered false hellebore	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Minuartia glabra</i>	Appalachian sandwort	O	F1	Cliffline	3	3	3	3	3	3
<i>Monotropsis odorata</i>	Sweet pinesap	S	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Monotropsis odorata</i>	Sweet pinesap	S	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Monotropsis odorata</i>	Sweet pinesap	S	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Oenothera perennis</i>	Small sundrops	O	F1	Grassland	1	1	1	1	1	1
<i>Oenothera perennis</i>	Small sundrops	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Oenothera perennis</i>	Small sundrops	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
Oenothera perennis	Small sundrops	O	F1	Mature Forest (general)	3	3	3	3	3	3
Orontium aquaticum	Golden club	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
Orontium aquaticum	Golden club	O	F2	Water (distance sensitive)	4	4	4	4	4	4
Oxalis montana	Mountain woodsorrel	O	F3	Mature Forest (general)	5	5	5	5	5	5
Packera paupercula	Balsam ragwort	O	F2	Grassland	2	2	2	2	2	2
Packera paupercula	Balsam ragwort	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
Packera paupercula	Balsam ragwort	O	F2	River Channels	4	4	4	4	4	4
Panax quinquefolius	Ginseng	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Panax trifolius	Dwarf ginseng	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
Panax trifolius	Dwarf ginseng	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
Parietaria floridana	Florida pellitory	O	F1	Cliffline	3	3	3	3	3	3
Parnassia asarifolia	Kidneyleaf grass-of-parnassus	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
Paxistima canbyi	Canby's mountain-lover	S	F1	Glades and Prairies	1	1	1	1	1	1
Paxistima canbyi	Canby's mountain-lover	S	F1	Cliffline	3	3	3	3	3	3
Paxistima canbyi	Canby's mountain-lover	S	F1	Grassland	1	1	1	1	1	1
Paxistima canbyi	Canby's mountain-lover	S	F1	Dry-Xeric Cedar Oak	1	1	1	1	1	1
Paxistima canbyi	Canby's mountain-lover	S	F1	Canopy Gaps	3	3	3	3	3	3
Paxistima canbyi	Canby's mountain-lover	S	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
Philadelphus hirsutus	Streambank mock orange	O	F1	River Channels	3	3	3	3	3	3
Philadelphus hirsutus	Streambank mock orange	O	F1	Open Midstory and Understory	2	1	2	2	2	2
Philadelphus hirsutus	Streambank mock orange	O	F1	Mature Forest (general)	3	3	3	3	3	3
Philadelphus hirsutus	Streambank mock orange	O	F1	Canopy Gaps	3	3	3	3	3	3
Philadelphus inodorus	Mock orange	O	F1	River Channels	3	3	3	3	3	3
Philadelphus inodorus	Mock orange	O	F1	Mature Forest (general)	3	3	3	3	3	3
Philadelphus inodorus	Mock orange	O	F1	Glades and Prairies	1	1	1	1	1	1
Phlox amplifolia	Broadleaf phlox	O	F3	Mature Forest (general)	5	5	5	5	5	5
Phlox amplifolia	Broadleaf phlox	O	F3	River Channels	5	5	5	5	5	5
Phlox subulata	Moss pink	O	F2	Cliffline	4	4	4	4	4	4
Platanthera cristata	Yellow-crested orchid	O	F1	Grassland	1	1	1	1	1	1
Platanthera cristata	Yellow-crested orchid	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
Platanthera cristata	Yellow-crested orchid	O	F1	Wetlands	1	1	1	1	1	1
Platanthera cristata	Yellow-crested orchid	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
Platanthera cristata	Yellow-crested orchid	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
Platanthera integrilabia	White fringeless orchid	S	F1	River Channels	3	3	3	3	3	3
Platanthera integrilabia	White fringeless orchid	S	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
Platanthera integrilabia	White fringeless orchid	S	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
Platanthera peramoena	Purple fringeless orchid	O	F2	Grassland	2	2	2	2	2	2
Platanthera peramoena	Purple fringeless orchid	O	F2	Lakeshores, large reservoirs	3	3	3	3	3	3
Platanthera peramoena	Purple fringeless orchid	O	F2	Pond Shore	3	3	3	3	3	3
Platanthera peramoena	Purple fringeless orchid	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Platanthera peramoena	Purple fringeless orchid	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
Polygala nuttallii	Nuttall's milkwort	O	F2	Glades and Prairies	2	2	2	2	2	2
Polygala nuttallii	Nuttall's milkwort	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
Polygala nuttallii	Nuttall's milkwort	O	F2	Canopy Gaps	4	4	4	4	4	4
Polygala nuttallii	Nuttall's milkwort	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
Polygala nuttallii	Nuttall's milkwort	O	F2	Cliffline	4	4	4	4	4	4
Polygala nuttallii	Nuttall's milkwort	O	F2	Open Midstory and Understory	3	2	3	3	3	3
Polygala nuttallii	Nuttall's milkwort	O	F2	Grassland	2	2	2	2	2	2
Polygala polygama var. polygama	Purple milkwort	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Polygala polygama var. polygama	Purple milkwort	O	F2	Grassland	2	2	2	2	2	2

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<i>Polygala polygama</i> var. <i>polygama</i>	Purple milkwort	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
<i>Polygala polygama</i> var. <i>polygama</i>	Purple milkwort	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
<i>Polygala polygama</i> var. <i>polygama</i>	Purple milkwort	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Polygonum cilinode</i>	Fringed black bindweed	O	F?	Canopy Gaps	3	3	3	3	3	3
<i>Polygonum cilinode</i>	Fringed black bindweed	O	F?	Grassland	1	1	1	1	1	1
<i>Polygonum cilinode</i>	Fringed black bindweed	O	F?	Early-aged Forest	3	1	3	3	3	3
<i>Populus grandidentata</i>	Large-tooth aspen	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Populus grandidentata</i>	Large-tooth aspen	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Potamogeton pulcher</i>	Spotted pondweed	O	F1	Water (distance sensitive)	3	3	3	3	3	3
<i>Prenanthes crepidinea</i>	Nodding rattlesnake-root	O	F2	River Channels	4	4	4	4	4	4
<i>Prenanthes crepidinea</i>	Nodding rattlesnake-root	O	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Prenanthes crepidinea</i>	Nodding rattlesnake-root	O	F2	Riparian (general)	4	4	4	4	4	4
<i>Ranunculus allegheniensis</i>	Alleghany mountain crowfoot	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Ranunculus allegheniensis</i>	Alleghany mountain crowfoot	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Ranunculus allegheniensis</i>	Alleghany mountain crowfoot	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Rhododendron arborescens</i>	Smooth azalea	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Rhododendron arborescens</i>	Smooth azalea	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Rhododendron arborescens</i>	Smooth azalea	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Rhododendron arborescens</i>	Smooth azalea	O	F3	Wetlands	3	3	3	3	3	3
<i>Rhododendron catawbiense</i>	Catawba rhododendron	O	F3	Cliffline	5	5	5	5	5	5
<i>Rhododendron catawbiense</i>	Catawba rhododendron	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Rhododendron catawbiense</i>	Catawba rhododendron	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Rhododendron catawbiense</i>	Catawba rhododendron	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Rhododendron catawbiense</i>	Catawba rhododendron	O	F3	Mature Yellow Pine and Mixed Pine-Oak	3	3	3	3	3	3
<i>Rhododendron cumberlandense</i>	Cumberland azalea	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Rhododendron cumberlandense</i>	Cumberland azalea	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Rhododendron prinophyllum</i>	Early azalea	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Rhododendron prinophyllum</i>	Early azalea	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Rhododendron prinophyllum</i>	Early azalea	O	F3	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	3	3	3	3	3	3
<i>Rhus typhina</i>	Staghorn sumac	O	F1	Early-aged Forest	3	1	3	3	3	3
<i>Rhus typhina</i>	Staghorn sumac	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Rhus typhina</i>	Staghorn sumac	O	F1	Grassland	1	1	1	1	1	1
<i>Rhynchosia tomentosa</i>	Hairy snoutbean	O	F2	Fire Adapted/Enhanced	3	2	4	4	4	3
<i>Rhynchosia tomentosa</i>	Hairy snoutbean	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Rhynchosia tomentosa</i>	Hairy snoutbean	O	F2	Canopy Gaps	4	4	4	4	4	4
<i>Rhynchosia tomentosa</i>	Hairy snoutbean	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
<i>Rhynchosia tomentosa</i>	Hairy snoutbean	O	F2	Grassland	2	2	2	2	2	2
<i>Rhynchospora globularis</i> var. <i>globularis</i>	Globe beaked-rush	O	F2	Mature Yellow Pine and Mixed Pine-Oak	2	2	2	2	2	2
<i>Rhynchospora globularis</i> var. <i>globularis</i>	Globe beaked-rush	O	F2	Canopy Gaps	4	4	4	4	4	4
<i>Rhynchospora globularis</i> var. <i>globularis</i>	Globe beaked-rush	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
<i>Rhynchospora globularis</i> var. <i>globularis</i>	Globe beaked-rush	O	F2	Grassland	2	2	2	2	2	2
<i>Sabatia campanulata</i>	Slender marsh pink	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Sabatia campanulata</i>	Slender marsh pink	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Sabatia campanulata</i>	Slender marsh pink	O	F1	Grassland	1	1	1	1	1	1
<i>Sabatia campanulata</i>	Slender marsh pink	O	F1	Wetlands	1	1	1	1	1	1

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
Sagittaria calycina var. calycina	Long-lobed arrowhead	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Sagittaria calycina var. calycina	Long-lobed arrowhead	O	F3	Pond Shore	4	4	4	4	4	4
Salvia urticifolia	Nettle-leaf sage	O	F1	Mature Forest (general)	3	3	3	3	3	3
Sambucus racemosa ssp. pubens	Red elderberry	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
Saxifraga michauxii	Michaux's saxifrage	O	F1	Cliffline	3	3	3	3	3	3
Schisandra glabra	Magnolia vine	S	F1	Mature Forest (general)	3	3	3	3	3	3
Schisandra glabra	Magnolia vine	S	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
Schisandra glabra	Magnolia vine	S	F1	Canopy Gaps	3	3	3	3	3	3
Schisandra glabra	Magnolia vine	S	F1	Cliffline	3	3	3	3	3	3
Scutellaria arguta	Hairy skullcap	S	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
Scutellaria arguta	Hairy skullcap	S	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
Scutellaria parvula	Small skullcap	O	F1	Mature Forest (general)	3	3	3	3	3	3
Scutellaria parvula	Small skullcap	O	F1	Grassland	1	1	1	1	1	1
Scutellaria saxatilis	Rock skullcap	S	F2	River Channels	4	4	4	4	4	4
Senecio pauperculus	Short-stem ragweed	O	F2	River Channels	4	4	4	4	4	4
Senecio pauperculus	Short-stem ragweed	O	F2	Grassland	2	2	2	2	2	2
Senecio pauperculus	Short-stem ragweed	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
Silene ovata	Mountain catchfly	S	F1	Mature Forest (general)	3	3	3	3	3	3
Silene ovata	Mountain catchfly	S	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
Silphium wasiotense	Wasioto rosinweed	O	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
Silphium wasiotense	Wasioto rosinweed	O	F2	Woodland	2	2	4	4	4	2
Silphium wasiotense	Wasioto rosinweed	O	F2	Fire Adapted/Enhanced	3	2	4	4	4	3
Silphium wasiotense	Wasioto rosinweed	O	F2	Mature Forest (general)	4	4	4	4	4	4
Silphium wasiotense	Wasioto rosinweed	O	F2	Early-aged Forest	4	2	4	4	4	4
Silphium wasiotense	Wasioto rosinweed	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Silphium wasiotense	Wasioto rosinweed	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
Solidago albopilosa	White-haired goldenrod	F	F2	Caves	3	3	3	3	3	3
Solidago arguta var. harrisii	Shale-barren goldenrod	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Solidago arguta var. harrisii	Shale-barren goldenrod	O	F3	Canopy Gaps	5	5	5	5	5	5
Solidago arguta var. harrisii	Shale-barren goldenrod	O	F3	Glades and Prairies	3	3	3	3	3	3
Solidago arguta var. harrisii	Shale-barren goldenrod	O	F3	Cliffline	5	5	5	5	5	5
Solidago rigida	Prairie goldenrod	O	F2	Glades and Prairies	2	2	2	2	2	2
Solidago rigida	Prairie goldenrod	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Solidago rigida	Prairie goldenrod	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Solidago rigida	Prairie goldenrod	O	F2	Grassland	2	2	2	2	2	2
Solidago rigida	Prairie goldenrod	O	F2	Fire Adapted/Enhanced	3	2	4	4	4	3
Solidago simplex var. randii	Rand's goldenrod	O	F3	River Channels	5	5	5	5	5	5
Solidago simplex var. randii	Rand's goldenrod	O	F3	Riparian (general)	5	5	5	5	5	5
Solidago simplex var. randii	Rand's goldenrod	O	F3	Cliffline	5	5	5	5	5	5
Solidago simplex var. randii	Rand's goldenrod	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
Solidago spathulata	Sticky goldenrod	O	F2	Riparian (general)	4	4	4	4	4	4
Solidago spathulata	Sticky goldenrod	O	F2	River Channels	4	4	4	4	4	4
Solidago spathulata	Sticky goldenrod	O	F2	Cliffline	4	4	4	4	4	4
Solidago spathulata	Sticky goldenrod	O	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
Spartina pectinata	Freshwater cordgrass	O	F1	Pond Shore	2	2	2	2	2	2
Spartina pectinata	Freshwater cordgrass	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
Spartina pectinata	Freshwater cordgrass	O	F1	Grassland	1	1	1	1	1	1
Spartina pectinata	Freshwater cordgrass	O	F1	Lakeshores, large reservoirs	2	2	2	2	2	2
Spigelia marilandica	Pink root	O	F2	Mature/old-aged Riparian Forest	4	4	4	4	4	4
Spigelia marilandica	Pink root	O	F2	Open Midstory and Understory	3	2	3	3	3	3

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Spigelia marilandica</i>	Pink root	O	F2	Canopy Gaps	4	4	4	4	4	4
<i>Spiraea virginiana</i>	Virginia spiraea	F	F1	River Channels	3	3	3	3	3	3
<i>Spiraea virginiana</i>	Virginia spiraea	F	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Spiranthes lucida</i>	Shining ladies'-tresses	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Spiranthes lucida</i>	Shining ladies'-tresses	O	F1	Grassland	1	1	1	1	1	1
<i>Spiranthes lucida</i>	Shining ladies'-tresses	O	F1	River Channels	3	3	3	3	3	3
<i>Sporobolus clandestinus</i>	Rough dropseed	O	F1	Grassland	1	1	1	1	1	1
<i>Sporobolus clandestinus</i>	Rough dropseed	O	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Stellaria longifolia</i>	Longleaf stitchwort	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Stellaria longifolia</i>	Longleaf stitchwort	O	F1	Grassland	1	1	1	1	1	1
<i>Stellaria longifolia</i>	Longleaf stitchwort	O	F1	Mature/old-aged Riparian Forest	3	3	3	3	3	3
<i>Stewartia ovata</i>	Mountain camellia	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Stewartia ovata</i>	Mountain camellia	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Symphoricarpos albus</i> var. <i>albus</i>	Snowberry	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Symphoricarpos albus</i> var. <i>albus</i>	Snowberry	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Symphoricarpos albus</i> var. <i>albus</i>	Snowberry	O	F1	Cliffline	3	3	3	3	3	3
<i>Synandra hispidula</i>	Gyandotte beauty	O	F3	Bogs, Springs, and Seeps	4	4	4	4	4	4
<i>Synandra hispidula</i>	Gyandotte beauty	O	F3	River Channels	5	5	5	5	5	5
<i>Synandra hispidula</i>	Gyandotte beauty	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Talinum teretifolium</i>	Roundleaf flame-flower	O	F1	Cliffline	3	3	3	3	3	3
<i>Talinum teretifolium</i>	Roundleaf flame-flower	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Taxus canadensis</i>	Canada yew	O	F2	Cliffline	4	4	4	4	4	4
<i>Taxus canadensis</i>	Canada yew	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Tephrosia spicata</i>	Spiked hoary-pea	O	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Tephrosia spicata</i>	Spiked hoary-pea	O	F1	Mature Yellow Pine and Mixed Pine-Oak	1	1	1	1	1	1
<i>Tephrosia spicata</i>	Spiked hoary-pea	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Tephrosia spicata</i>	Spiked hoary-pea	O	F1	River Channels	3	3	3	3	3	3
<i>Tephrosia spicata</i>	Spiked hoary-pea	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Thalictrum mirabile</i>	Little mountain meadowrue	S	F3	Cliffline	5	5	5	5	5	5
<i>Thalictrum mirabile</i>	Little mountain meadowrue	S	F3	Caves	4	4	4	4	4	4
<i>Thaspium pinnatifidum</i>	Mountain thaspium	S	F2	Grass/Forb Woodland or Wooded Grassland	2	2	4	4	4	2
<i>Thaspium pinnatifidum</i>	Mountain thaspium	S	F2	Mature Xeric-Mesic Oak	4	3	4	4	4	4
<i>Thaspium pinnatifidum</i>	Mountain thaspium	S	F2	Dry-Xeric Cedar Oak	2	2	2	2	2	2
<i>Thaspium pinnatifidum</i>	Mountain thaspium	S	F2	Canopy Gaps	4	4	4	4	4	4
<i>Thaspium pinnatifidum</i>	Mountain thaspium	S	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Thermopsis mollis</i>	Appalachian golden-banner	O	F1	Fire Adapted/Enhanced	2	1	3	3	3	2
<i>Thermopsis mollis</i>	Appalachian golden-banner	O	F1	Mature Xeric-Mesic Oak	3	2	3	3	3	3
<i>Thermopsis mollis</i>	Appalachian golden-banner	O	F1	Open Midstory and Understory	2	1	2	2	2	2
<i>Thermopsis mollis</i>	Appalachian golden-banner	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Thermopsis mollis</i>	Appalachian golden-banner	O	F1	Canopy Gaps	3	3	3	3	3	3
<i>Thuja occidentalis</i>	Northern white cedar	O	F2	River Channels	4	4	4	4	4	4
<i>Thuja occidentalis</i>	Northern white cedar	O	F2	Cliffline	4	4	4	4	4	4
<i>Tragia urticifolia</i>	Nettle-leaf noseburn	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Tragia urticifolia</i>	Nettle-leaf noseburn	O	F1	Dry-Xeric Cedar Oak	1	1	1	1	1	1
<i>Tragia urticifolia</i>	Nettle-leaf noseburn	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Tragia urticifolia</i>	Nettle-leaf noseburn	O	F1	Grassland	1	1	1	1	1	1

Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Tragia urticifolia</i>	Nettle-leaf noseburn	O	F1	Glades and Prairies	1	1	1	1	1	1
<i>Trichomanes boschianum</i>	Bristle fern	O	F3	Caves	4	4	4	4	4	4
<i>Trichostema brachiatum</i>	Glade bluecurls	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Trichostema brachiatum</i>	Glade bluecurls	O	F3	Grass/Forb Woodland or Wooded Grassland	3	3	5	5	5	3
<i>Trichostema brachiatum</i>	Glade bluecurls	O	F3	Cliffline	5	5	5	5	5	5
<i>Trientalis borealis</i>	Northern starflower	O	F1	Mixed Mesophytic Hardwood	3	3	3	3	3	3
<i>Trillium sulcatum</i>	Barksdale trillium	O	F3	Early-aged Forest	5	3	5	5	5	5
<i>Trillium sulcatum</i>	Barksdale trillium	O	F3	Grassland	3	3	3	3	3	3
<i>Trillium sulcatum</i>	Barksdale trillium	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Trillium sulcatum</i>	Barksdale trillium	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Triphora trianthophora</i>	Nodding pogonia	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Triphora trianthophora</i>	Nodding pogonia	O	F3	Mixed Mesophytic Hardwood	5	5	5	5	5	5
<i>Triphora trianthophora</i>	Nodding pogonia	O	F3	Wetlands	3	3	3	3	3	3
<i>Triphora trianthophora</i>	Nodding pogonia	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
<i>Triphora trianthophora</i>	Nodding pogonia	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<i>Triphora trianthophora</i>	Nodding pogonia	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Vernonia noveboracensis</i>	New York ironweed	O	F3	River Channels	5	5	5	5	5	5
<i>Vernonia noveboracensis</i>	New York ironweed	O	F3	Grassland	3	3	3	3	3	3
<i>Vernonia noveboracensis</i>	New York ironweed	O	F3	Grassland	3	3	3	3	3	3
<i>Vernonia noveboracensis</i>	New York ironweed	O	F3	Bogs, Springs, and Seeps	4	4	4	4	4	4
<i>Vernonia noveboracensis</i>	New York ironweed	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Viola pubescens</i> var. <i>leiocarpon</i>	Yellow violet	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Viola pubescens</i> var. <i>leiocarpon</i>	Yellow violet	O	F3	Canopy Gaps	5	5	5	5	5	5
<i>Viola pubescens</i> var. <i>leiocarpon</i>	Yellow violet	O	F3	Open Midstory and Understory	4	3	4	4	4	4
<i>Viola pubescens</i> var. <i>leiocarpon</i>	Yellow violet	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
<i>Vitis labrusca</i>	Fox grape	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Vitis labrusca</i>	Fox grape	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Vitis labrusca</i>	Fox grape	O	F1	Open Midstory and Understory	2	1	2	2	2	2
<i>Vitis labrusca</i>	Fox grape	O	F1	Grassland	1	1	1	1	1	1
<i>Vitis labrusca</i>	Fox grape	O	F1	Mature Forest (general)	3	3	3	3	3	3
<i>Vitis rupestris</i>	Sand grape	S	F2	River Channels	4	4	4	4	4	4
<i>Xyris difformis</i>	Yellow-eyed grass	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
<i>Xyris difformis</i>	Yellow-eyed grass	O	F2	Wetlands	2	2	2	2	2	2
<i>Zanthoxylum americana</i>	Toothache tree	O	F3	River Channels	5	5	5	5	5	5
<i>Zanthoxylum americana</i>	Toothache tree	O	F3	Mature Forest (general)	5	5	5	5	5	5
<i>Zanthoxylum americana</i>	Toothache tree	O	F3	Mature Xeric-Mesic Oak	5	4	5	5	5	5
<b>Nonvascular Plants</b>										
<i>Brothera leana</i>	Moss	O	F2	Mature Forest (general)	4	4	4	4	4	4
<i>Bryoxiphium norvegicum</i>	Sword moss	O	F3	River Channels	5	5	5	5	5	5
<i>Bryoxiphium norvegicum</i>	Sword moss	O	F3	Caves	4	4	4	4	4	4
<i>Bryoxiphium norvegicum</i>	Sword moss	O	F3	Spray Cliffs	4	4	4	4	4	4
<i>Dichodontium pellucidum</i>	Moss	O	F1	Cliffline	3	3	3	3	3	3
<i>Dichodontium pellucidum</i>	Moss	O	F1	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Dichodontium pellucidum</i>	Moss	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Eucladium verticillatum</i>	Lime-seep eucladium	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
<i>Eucladium verticillatum</i>	Lime-seep eucladium	O	F2	Caves	3	3	3	3	3	3
<i>Eucladium verticillatum</i>	Lime-seep eucladium	O	F2	Cliffline	4	4	4	4	4	4
<i>Hygrohypnum closteri</i>	Closter's brook-hypnum	S	F1	River Channels	3	3	3	3	3	3
<i>Hygrohypnum closteri</i>	Closter's brook-hypnum	S	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Neckera pennata</i>	A Moss	O	F2	Mixed Mesophytic Hardwood	4	4	4	4	4	4
<i>Neckera pennata</i>	A Moss	O	F2	Mature Forest (general)	4	4	4	4	4	4



Scientific Name	Common Name	Status	FRank	Habitat Element	A	B-1	C	C-1	D	E-1
<i>Neckera pennata</i>	A Moss	O	F2	Mature Hemlock-White Pine	2	2	2	2	2	2
<i>Plagiochila austinii</i>	Liverwort	S	F1	Cliffline	3	3	3	3	3	3
<i>Plagiochila sullivanii</i> var. <i>spinigera</i>	Sullivan's leafy liverwort	S	F1	Cliffline	3	3	3	3	3	3
<i>Plagiochila sullivanii</i> var. <i>sullivanii</i>	Sullivan's leafy liverwort	S	F1	Cliffline	3	3	3	3	3	3
<i>Platydictya confervoides</i>	Alga-like matted-moss	O	F3	Riparian (general)	5	5	5	5	5	5
<i>Platydictya confervoides</i>	Alga-like matted-moss	O	F3	Mature/old-aged Riparian Forest	5	5	5	5	5	5
<i>Platydictya confervoides</i>	Alga-like matted-moss	O	F3	Cliffline	5	5	5	5	5	5
<i>Polytrichum pallidisetum</i>	Spraycliff Haircap Moss	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Polytrichum pallidisetum</i>	Spraycliff Haircap Moss	O	F1	Cliffline	3	3	3	3	3	3
<i>Radula sullivanii</i>	Liverwort	S	F1	Riparian (general)	3	3	3	3	3	3
<i>Radula sullivanii</i>	Liverwort	S	F1	Cliffline	3	3	3	3	3	3
<i>Rhytidium rugosum</i>	Golden tundra-moss	O	F2	Cliffline	4	4	4	4	4	4
<i>Scopelophila cataractae</i>	Agoyan cataract moss	S	F1	Mature High-Elev. Mesic Hardwood (Pine Mtn.)	1	1	1	1	1	1
<i>Scopelophila cataractae</i>	Agoyan cataract moss	S	F1	Caves	2	2	2	2	2	2
<i>Scopelophila cataractae</i>	Agoyan cataract moss	S	F1	Grassland	1	1	1	1	1	1
<i>Sphagnum bartlettianum</i>	Bartlett's Sphagnum	O	F2	Wetlands	2	2	2	2	2	2
<i>Sphagnum bartlettianum</i>	Bartlett's Sphagnum	O	F2	Bogs, Springs, and Seeps	3	3	3	3	3	3
<i>Sphagnum fuscum</i>	Brown peatmoss	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Sphagnum fuscum</i>	Brown peatmoss	O	F1	Grass/Forb Woodland or Wooded Grassland	1	1	3	3	3	1
<i>Sphagnum macrophyllum</i>	Large-leaved Sphagnum	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Sphagnum macrophyllum</i>	Large-leaved Sphagnum	O	F1	Water (distance sensitive)	3	3	3	3	3	3
<i>Sphagnum magellanicum</i>	Magellan's Sphagnum	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Telarania nematodes</i>	Worm Liverwort	O	F1	Bogs, Springs, and Seeps	2	2	2	2	2	2
<i>Tortula papillosa</i>	Papillose tortula	O	F2	Cliffline	4	4	4	4	4	4
<i>Tortula papillosa</i>	Papillose tortula	O	F2	Open Midstory and Understory	3	2	3	3	3	3
<i>Tortula papillosa</i>	Papillose tortula	O	F2	Grassland	2	2	2	2	2	2

## VIABILITY OUTCOME FOR AQUATIC PETS SPECIES, TABLE H – 3

### Key to Table H – 3.

#### Viability Outcome

##### Code Description

- A Species occurs within watersheds with no impairment. Likelihood of maintaining viability is High.
- B Species is potentially at risk in the watershed; however, Forest Service action may influence habitat conditions on public lands that will keep it well distributed where its associated habitat occurs on National Forest System lands. Therefore, likelihood of maintaining viability is Moderate.
- C Species is potentially at risk within the watershed; however, opportunities for the Forest Service to affect outcomes for the species in the watershed are limited. PETS species within this outcome are off National Forest System lands. Therefore, species viability in the watershed may be at risk.
- D The species is so rare within the watershed (population is at Very Low density and/or at only a few local sites) that stochastic events (accidents, weather events, etc.) may place persistence of the species within the watershed at risk. Forest Service actions could influence conditions in the watershed to keep the species relatively secure. Therefore, likelihood of maintaining viability is Moderate to Low.
- E The species is so rare within the watershed (population is at Very Low density and/or at only a few local sites) that stochastic events (accidents, weather events, etc.) may place persistence of the species within the watershed at risk. Forest Service ability to influence the species is limited. Therefore, species viability in the watershed may be at risk.

#### Stressors

##### Code Description

- S Sedimentation
- P Point Source Pollutants
- T Temperature
- F Altered stream flow

#### Watershed Health Index (WHI)

##### Code Description

- E Excellent
- A Average
- BA Below average
- N/A Not applicable

**Table H - 3. Aquatic PETS species on the DBNF by watershed number and viability outcome (Aquatic Viability Section of Chapter 3)**

COMMON NAME	SCIENTIFIC NAME	Watershed	Present Owner-ship	Viability Outcome						COMMENTS
				A	B	C	D	E	WHI	
Lake sturgeon	<i>Acipenser fulvescens</i>	05130101370	57.6	SPTF					E	
Cumberland elktoe	<i>Alasmidonta atropurpurea</i>	05130101370	57.6	SPTF					E	
Cumberland elktoe	<i>Alasmidonta atropurpurea</i>	05130101410	29.7	SPTF					E	
Cumberland elktoe	<i>Alasmidonta atropurpurea</i>	05130104290	60.6	SPTF					E	Minimal ownership (>17%)
Elktoe	<i>Alasmidonta marginata</i>	05100204120	50.2	SPTF					E	Minimal ownership (>17%)
Elktoe	<i>Alasmidonta marginata</i>	05130101360	17.1	PTF		S			N/A	
Elktoe	<i>Alasmidonta marginata</i>	05130102030	44.5	SPTF					E	
Elktoe	<i>Alasmidonta marginata</i>	05130102050	38.7	SPTF					E	
Elktoe	<i>Alasmidonta marginata</i>	05130102070	46.7	SPTF					E	
Elktoe	<i>Alasmidonta marginata</i>	05130104310	5.1	PTF		S			N/A	
Elktoe	<i>Alasmidonta marginata</i>	05100101040	57.3	SPTF					E	
Eastern sand darter	<i>Ammocrypta pellucida</i>	05100101040	57.3	SPTF					E	
Eastern sand darter	<i>Ammocrypta pellucida</i>	05100101100	31.8	SPTF					E	
Eastern sand darter	<i>Ammocrypta pellucida</i>	05100101130	29.8	SPTF					E	
Eastern sand darter	<i>Ammocrypta pellucida</i>	05100202010	8.4	PTF		S			N/A	On private upstream from major lake
Eastern sand darter	<i>Ammocrypta pellucida</i>	05100202030	18.5	SPTF					E	On private upstream from major lake
Eastern sand darter	<i>Ammocrypta pellucida</i>	05100203010	60.8	SPTF					E	
Eastern sand darter	<i>Ammocrypta pellucida</i>	05100203020	17.4	PTF		S			N/A	Minimal ownership (>17%)
Eastern sand darter	<i>Ammocrypta pellucida</i>	05100203040	14.2	PTF		S			N/A	
Eastern sand darter	<i>Ammocrypta pellucida</i>	05100204120	50.2	SPTF					E	Minimal ownership (>17%)
Cumberland papershell	<i>Anodontooides denigratus</i>	05130101410	29.7	SPTF					E	
Big South Fork crayfish	<i>Cambarus bouchardi</i>	05130104250	43.3	SPTF					E	
Big South Fork crayfish	<i>Cambarus bouchardi</i>	05130104270	5.5	PTF		S			N/A	On private upstream from major lake
Redside dace	<i>Clinostomus elongatus</i>	05100101100	31.8	SPTF					E	
Redside dace	<i>Clinostomus elongatus</i>	05100101110	37.4	SPTF					E	
Redside dace	<i>Clinostomus elongatus</i>	05100101140	28.4	SPTF					E	
Dromedary Pearlymussel	<i>Dromus dromas</i>	05130104250	43.3	SPTF					E	
Cumberlandian Combshell	<i>Epioblasma brevidens</i>	05130101370	57.6	SPTF					E	
Cumberlandian Combshell	<i>Epioblasma brevidens</i>	05130102070	46.7	SPTF					E	
Cumberlandian Combshell	<i>Epioblasma brevidens</i>	05130103040	9.6	PTF		S			N/A	
Cumberlandian Combshell	<i>Epioblasma brevidens</i>	05130104250	43.3	SPTF					E	
Oyster Mussel	<i>Epioblasma capsaeformis</i>	05130101370	57.6	SPTF					E	
Oyster Mussel	<i>Epioblasma capsaeformis</i>	05130102070	46.7	SPTF					E	
Oyster Mussel	<i>Epioblasma capsaeformis</i>	05130103040	9.6	PTF		S			N/A	
Oyster Mussel	<i>Epioblasma capsaeformis</i>	05130104250	43.3	SPTF					E	
Yellow Blossom	<i>Epioblasma florentina</i>	05130103040	9.6	PTF		S			N/A	
Yellow Blossom	<i>Epioblasma florentina</i>	05130104250	43.3	SPTF					E	
Tan Riffleshell	<i>Epioblasma florentina walkeri</i>	05130104250	43.3	SPTF					E	
Purple Catpaw	<i>Epioblasma obliquata</i>	05130104250	43.3	SPTF					E	
Snuffbox	<i>Epioblasma triquetra</i>	05100101040	57.3	SPTF					E	
Snuffbox	<i>Epioblasma triquetra</i>	05100202010	8.4	PTF		S			N/A	On private upstream from major lake
Snuffbox	<i>Epioblasma triquetra</i>	05100203010	60.8	SPTF					E	
Snuffbox	<i>Epioblasma triquetra</i>	05100203020	17.4	PTF		S			N/A	Minimal ownership (>17%)
Snuffbox	<i>Epioblasma triquetra</i>	05100203040	14.2	PTF		S			N/A	

COMMON NAME	SCIENTIFIC NAME	Watershed	Present Owner-ship	Viability Outcome					WHI	COMMENTS
				A	B	C	D	E		
Snuffbox	<i>Epioblasma triquetra</i>	05100204120	50.2	SPTF					E	Minimal ownership (>17%)
Snuffbox	<i>Epioblasma triquetra</i>	05130103040	9.6	PTF		S			N/A	
Ashy darter	<i>Etheostoma cinereum</i>	05130102030	44.5	SPTF					E	
Ashy darter	<i>Etheostoma cinereum</i>	05130102040	10.2	PTF		S			N/A	
Ashy darter	<i>Etheostoma cinereum</i>	05130102050	38.7	SPTF					E	
Ashy darter	<i>Etheostoma cinereum</i>	05130102070	46.7	SPTF					E	
Ashy darter	<i>Etheostoma cinereum</i>	05130103040	9.6	PTF		S			N/A	
Ashy darter	<i>Etheostoma cinereum</i>	05130104250	43.3	SPTF					E	
Ashy darter	<i>Etheostoma cinereum</i>	05130104270	5.5	PTF		S			N/A	On private upstream from major lake
Ashy darter	<i>Etheostoma cinereum</i>	05130104310	5.1	PTF		S			N/A	
Spotted darter	<i>Etheostoma maculatum</i>	05100204020	8.7	PTF		S			N/A	
Duskytail Darter	<i>Etheostoma percnum</i>	05130104250	43.3	SPTF					E	
Duskytail Darter	<i>Etheostoma percnum</i>	05130104270	5.5	PTF		S			N/A	On private upstream from major lake
Arrow darter	<i>Etheostoma sagitta spilatum</i>	05100202030	18.5	SPTF					E	On private upstream from major lake
Arrow darter	<i>Etheostoma sagitta spilatum</i>	05100203010	60.8	SPTF					E	
Arrow darter	<i>Etheostoma sagitta spilatum</i>	05100203020	17.4	PTF		S			N/A	Minimal ownership (>17%)
Arrow darter	<i>Etheostoma sagitta spilatum</i>	05100204120	50.2	SPTF					E	Minimal ownership (>17%)
Arrow darter	<i>Etheostoma sagitta spilatum</i>	05130101370	57.6	SPTF					E	
Arrow darter	<i>Etheostoma sagitta spilatum</i>	05130101410	29.7	SPTF					E	
Arrow darter	<i>Etheostoma sagitta spilatum</i>	05130101430	71.6	SPTF					E	
Arrow darter	<i>Etheostoma sagitta spilatum</i>	05130104270	5.5	PTF		S			N/A	On private upstream from major lake
Cumberland Johnny darter	<i>Etheostoma susanae</i>	05100203010	60.8	SPTF					E	
Cumberland Johnny darter	<i>Etheostoma susanae</i>	05130101360	17.1	PTF		S			N/A	
Cumberland Johnny darter	<i>Etheostoma susanae</i>	05130101370	57.6	SPTF					E	
Cumberland Johnny darter	<i>Etheostoma susanae</i>	05130101400	19.5	SPTF					E	
Cumberland Johnny darter	<i>Etheostoma susanae</i>	05130101410	29.7	SPTF					E	
Cumberland Johnny darter	<i>Etheostoma susanae</i>	05130101420	62.3	SPTF					E	
Cumberland Johnny darter	<i>Etheostoma susanae</i>	05130101430	71.6	SPTF					E	
Cumberland Johnny darter	<i>Etheostoma susanae</i>	05130102070	46.7	SPTF					E	
Cumberland Johnny darter	<i>Etheostoma susanae</i>	05130104270	5.5	PTF		S			N/A	On private upstream from major lake
Tippecanoe darter	<i>Etheostoma tippecanoe</i>	05100101040	57.3	SPTF					E	
Tippecanoe darter	<i>Etheostoma tippecanoe</i>	05100203020	17.4	PTF		S			N/A	Minimal ownership (>17%)
Tippecanoe darter	<i>Etheostoma tippecanoe</i>	05130104270	5.5	PTF		S			N/A	On private upstream from major lake
Long-solid	<i>Fusconaia subrotunda</i>	05130102070	46.7	SPTF					E	
Long-solid	<i>Fusconaia subrotunda</i>	05130104250	43.3	SPTF					E	
Cracking Pearlymussel	<i>Hemistena lata</i>	05130104250	43.3	SPTF					E	
Ohio lamprey	<i>Ichthyomyzon bdellium</i>	05100101130	29.8	SPTF					E	
Ohio lamprey	<i>Ichthyomyzon bdellium</i>	05100202030	18.5	SPTF					E	On private upstream from major lake
Ohio lamprey	<i>Ichthyomyzon bdellium</i>	05100203040	14.2	PTF		S			N/A	
Ohio lamprey	<i>Ichthyomyzon bdellium</i>	05130104290	60.6	SPTF					E	Minimal ownership (>17%)
Ohio lamprey	<i>Ichthyomyzon bdellium</i>	05130104310	5.1	PTF		S			N/A	
Northern Brook lamprey	<i>Ichthyomyzon fossor</i>	05100202010	8.4	PTF		S			N/A	On private upstream from major lake
Northern Brook lamprey	<i>Ichthyomyzon fossor</i>	05100202020	0.2	PTF		S			N/A	
Northern Brook lamprey	<i>Ichthyomyzon fossor</i>	05100203010	60.8	SPTF					E	
Northern Brook lamprey	<i>Ichthyomyzon fossor</i>	05100203040	14.2	PTF		S			N/A	
Mountain Brook lamprey	<i>Ichthyomyzon greeleyi</i>	05130102070	46.7	SPTF					E	
Mountain Brook lamprey	<i>Ichthyomyzon greeleyi</i>	05130104310	5.1	PTF		S			N/A	

COMMON NAME	SCIENTIFIC NAME	Watershed	Present Owner-ship	Viability Outcome					WHI	COMMENTS
				A	B	C	D	E		
American Brook lamprey	<i>Lampetra appendix</i>	05100202010	8.4	PTF		S			N/A	On private upstream from major lake
American Brook lamprey	<i>Lampetra appendix</i>	05100202030	18.5	SPTF					E	On private upstream from major lake
American Brook lamprey	<i>Lampetra appendix</i>	05100204120	50.2	SPTF					E	Minimal ownership (>17%)
American Brook lamprey	<i>Lampetra appendix</i>	05100204140	20.5	SPTF					E	
Pocketbook	<i>Lampsilis ovata</i>	05130101370	57.6	SPTF					E	
Pocketbook	<i>Lampsilis ovata</i>	05130104250	43.3	SPTF					E	
Pocketbook	<i>Lampsilis ovata</i>	05130104310	5.1	PTF		S			N/A	
Palezone Shiner	<i>Notropis albizonatus</i>	05130104270	5.5	PTF		S			N/A	On private upstream from major lake
Palezone Shiner	<i>Notropis albizonatus</i>	05130104310	5.1	PTF		S			N/A	
Sawfin shiner	<i>Notropis sp. Cf. spectrunculus</i>	05130101410	29.7	SPTF					E	
Sawfin shiner	<i>Notropis sp. Cf. spectrunculus</i>	05130102030	44.5	SPTF					E	On FS but most of the upper watershed is private
Sawfin shiner	<i>Notropis sp. Cf. spectrunculus</i>	05130102060	6.8	PTF		S			N/A	On FS but most of the upper watershed is private
Sawfin shiner	<i>Notropis sp. Cf. spectrunculus</i>	05130104310	5.1	PTF		S			N/A	
Northern madtom	<i>Noturus stigmosus</i>	05100202010	8.4	PTF		S			N/A	On private upstream from major lake
Northern madtom	<i>Noturus stigmosus</i>	05100202030	18.5	SPTF					E	On private upstream from major lake
Littlewing Pearlymussel	<i>Pegias fabula</i>	05130102030	44.5	SPTF					E	On FS but most of the upper watershed is private
Littlewing Pearlymussel	<i>Pegias fabula</i>	05130102040	10.2	PTF		S			N/A	
Littlewing Pearlymussel	<i>Pegias fabula</i>	05130102050	38.7	SPTF					E	
Littlewing Pearlymussel	<i>Pegias fabula</i>	05130102090	34.5	PTF		S			A	
Littlewing Pearlymussel	<i>Pegias fabula</i>	05130103040	9.6	PTF		S			N/A	
Littlewing Pearlymussel	<i>Pegias fabula</i>	05130104310	5.1	PTF		S			N/A	
Blotchside logperch	<i>Percina burtoni</i>	05130104310	5.1	PTF		S			N/A	
Gilt darter	<i>Percina evides</i>	05100101040	57.3	SPTF					E	
Gilt darter	<i>Percina evides</i>	05100202030	18.5	SPTF					E	On private upstream from major lake
Gilt darter	<i>Percina evides</i>	05100203020	17.4	PTF		S			N/A	Minimal ownership (>17%)
Longhead darter	<i>Percina macrocephala</i>	05100203010	60.8	SPTF					E	
Longhead darter	<i>Percina macrocephala</i>	05130104310	5.1	PTF		S			N/A	
Olive darter	<i>Percina squamata</i>	05130102030	44.5	SPTF					E	On FS but most of the upper watershed is private
Olive darter	<i>Percina squamata</i>	05130102040	10.2	PTF		S			N/A	
Olive darter	<i>Percina squamata</i>	05130102070	46.7	SPTF					E	
Olive darter	<i>Percina squamata</i>	05130104250	43.3	SPTF					E	
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130101350	4.7	PTF		S			N/A	
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130101370	57.6	SPTF					E	
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130101400	19.5	SPTF					E	
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130101410	29.7	SPTF					E	
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130101420	62.3	SPTF					E	
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130101430	71.6	SPTF					E	
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130102070	46.7	SPTF					E	
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130103010	60.7	SPTF					E	
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130104270	5.5	PTF		S			N/A	On private upstream from major lake
Blackside Dace	<i>Phoxinus cumberlandensis</i>	05130104290	60.6	SPTF					E	Minimal ownership (>17%)
Sheepnose	<i>Plethobasus cyphus</i>	05100101040	57.3	SPTF					E	
Clubshell	<i>Pleurobema clava</i>	05130102040	10.2	PTF		S			N/A	
Clubshell	<i>Pleurobema clava</i>	05130103010	60.7	SPTF					E	
Clubshell	<i>Pleurobema clava</i>	05130104250	43.3	SPTF					E	

COMMON NAME	SCIENTIFIC NAME	Watershed	Present Owner-ship	Viability Outcome					WHI	COMMENTS
				A	B	C	D	E		
Tennessee clubshell	<i>Pleurobema oviforme</i>	05130102030	44.5	SPTF					E	On FS but most of the upper watershed is private
Tennessee clubshell	<i>Pleurobema oviforme</i>	05130102040	10.2	PTF		S			N/A	
Tennessee clubshell	<i>Pleurobema oviforme</i>	05130102050	38.7	SPTF					E	
Tennessee clubshell	<i>Pleurobema oviforme</i>	05130102060	6.8	PTF		S			N/A	On FS but most of the upper watershed is private
Tennessee clubshell	<i>Pleurobema oviforme</i>	05130103010	60.7	SPTF					E	
Tennessee clubshell	<i>Pleurobema oviforme</i>	05130103040	9.6	PTF		S			N/A	
Tennessee clubshell	<i>Pleurobema oviforme</i>	05130104310	5.1	PTF		S			N/A	
Pyramid pigtoe	<i>Pleurobema pyramidatum</i>	05130104250	43.3	SPTF					E	
Paddlefish	<i>Polyodon spathula</i>	05100101040	57.3	SPTF					E	
Paddlefish	<i>Polyodon spathula</i>	05130104310	5.1	PTF		S			N/A	
Fluted Kidneyshell	<i>Ptychobranchus subtentum</i>	05100204120	50.2	SPTF					E	Minimal ownership (>17%)
Fluted Kidneyshell	<i>Ptychobranchus subtentum</i>	05130101370	57.6	SPTF					E	
Fluted Kidneyshell	<i>Ptychobranchus subtentum</i>	05130102040	10.2	PTF		S			N/A	
Fluted Kidneyshell	<i>Ptychobranchus subtentum</i>	05130102070	46.7	SPTF					E	
Fluted Kidneyshell	<i>Ptychobranchus subtentum</i>	05130103010	60.7	SPTF					E	
Fluted Kidneyshell	<i>Ptychobranchus subtentum</i>	05130103040	9.6	PTF		S			N/A	
Rough Rockshell	<i>Quadrula tuberosa</i>	05130101370	57.6	SPTF					E	
Salamander mussel	<i>Simpsonaias ambigua</i>	05100101090	11.3	PTF		S			N/A	
Salamander mussel	<i>Simpsonaias ambigua</i>	05100204120	50.2	SPTF					E	Minimal ownership (>17%)
Purple lilliput	<i>Toxolasma lividus</i>	05130102030	44.5	SPTF					E	On FS but most of the upper watershed is private
Purple lilliput	<i>Toxolasma lividus</i>	05130102040	10.2	PTF		S			N/A	
Purple lilliput	<i>Toxolasma lividus</i>	05130102050	38.7	SPTF					E	
Purple lilliput	<i>Toxolasma lividus</i>	05130104310	5.1	PTF		S			N/A	
Southern cavefish	<i>Typhlichthys subterraneus</i>	05130103010	60.7	SPTF					E	
Little Spectaclecase	<i>Villosa lienosa</i>	05100202010	8.4	PTF		S			N/A	On private upstream from major lake
Little Spectaclecase	<i>Villosa lienosa</i>	05100203010	60.8	SPTF					E	
Little Spectaclecase	<i>Villosa lienosa</i>	05100203020	17.4	PTF		S			N/A	Minimal ownership (>17%)
Little Spectaclecase	<i>Villosa lienosa</i>	05100204120	50.2	SPTF					E	Minimal ownership (>17%)
Little Spectaclecase	<i>Villosa lienosa</i>	05130101370	57.6	SPTF					E	
Little Spectaclecase	<i>Villosa lienosa</i>	05130102040	10.2	PTF		S			N/A	
Little Spectaclecase	<i>Villosa lienosa</i>	05130102070	46.7	SPTF					E	
Little Spectaclecase	<i>Villosa lienosa</i>	05130103040	9.6	PTF		S			N/A	
Little Spectaclecase	<i>Villosa lienosa</i>	05130104250	43.3	SPTF					E	
Cumberland Bean	<i>Villosa trabalis</i>	05130101370	57.6	SPTF					E	
Cumberland Bean	<i>Villosa trabalis</i>	05130102030	44.5	SPTF					E	On FS but most of the upper watershed is private
Cumberland Bean	<i>Villosa trabalis</i>	05130102040	10.2	PTF		S			N/A	
Cumberland Bean	<i>Villosa trabalis</i>	05130102050	38.7	SPTF					E	
Cumberland Bean	<i>Villosa trabalis</i>	05130102060	6.8	PTF		S			N/A	On FS but most of the upper watershed is private
Cumberland Bean	<i>Villosa trabalis</i>	05130102070	46.7	SPTF					E	
Cumberland Bean	<i>Villosa trabalis</i>	05130102090	34.5	PTF		S			A	
Cumberland Bean	<i>Villosa trabalis</i>	05130103040	9.6	PTF		S			N/A	
Cumberland Bean	<i>Villosa trabalis</i>	05130104310	5.1	PTF		S			N/A	
Mountain clubshell	<i>Villosa vanuxemensis</i>	05130102030	44.5	SPTF					E	On FS but most of the upper watershed is private
Mountain clubshell	<i>Villosa vanuxemensis</i>	05130102040	10.2	PTF		S			N/A	
Mountain clubshell	<i>Villosa vanuxemensis</i>	05130103010	60.7	SPTF					E	

# Appendix I

## RESPONSE TO PUBLIC COMMENTS

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## **RESPONSE TO PUBLIC COMMENTS**

### **INTRODUCTION AND PROCESS**

#### **Introduction**

This appendix contains summaries of public comment received regarding the Draft Environmental Impact Statement and Proposed Revised Land and Resource Management Plan for the Daniel Boone National Forest. The comment period ran from May 16 to August 14, 2003. The Forest Service received 1,181 responses, including letters, emails, and faxes; 625 of these were form letters and 556 were responses with original text.

Included are an explanation of the content analysis process, an overview of comments, a summary of demographics of those who commented, and finally a detailed summary of public concerns and agency responses by topic. The Overview of Comments section provides a summary of comments expressed for each topic. The Demographics section includes several tables displaying various classifications of the commenters. The Summary of Public Concerns and Agency Response section contains summarized statements that represent all the concerns and the Forest Service's response. Associated comments can be found in the process records.

#### **Content Analysis Process**

The content analysis was organized to provide a topical review of voluminous comments in a format that aids decision makers in their consideration and agency response. After each comment was analyzed, it was assigned a subject and category code. After all comments and their assigned codes were entered into the database, writer/analysts evaluated all the comments in each subject area and identified specific concerns. There could have been only one or as many as several hundred comments addressing the same concern, but the writers composed a summary statement to reflect that concern. This process helps planners and decision makers identify issues, determine how to respond to concerns, and decide what changes in the document or proposed action should result. Analysts did not make any judgments about the relative merit or substance of comments as they composed statements to summarize public concerns. All concerns have been summarized and presented to decision makers who will determine how to respond. They will also determine if any changes should be made to the proposed action or plan.

Content analysis is a method of eliciting meanings, ideas, and other information from written text, pictures, or audio or video messages. The Content Analysis Team (CAT), a specialized Forest Service unit that analyzes public comment on federal land and resource management agency projects and proposals, developed this methodology, which takes both qualitative and quantitative approaches. In addition to discovering specific demographic information and developing a mailing list of respondents, this systematic process can identify individual comments by topic in each response, evaluate similar comments from different responses, and summarize like comments as specific concern statements. The process also provides a relational database capable of reporting various types of information while linking comments to original letters.

Through the content analysis process, CAT analysts strive to identify all relevant issues, not just those represented by the majority of respondents. The breadth, depth, and rationale of each comment are taken into account. Thus, CAT analysts organize concern statements to facilitate systematic review and response by decision makers.

Each response was analyzed, and each comment that contained a stand-alone argument in support of a particular management action and its accompanying rationale, was identified. Each comment was assigned a subject and category code that allowed all comments to be sorted by topic. From the many comments regarding each topic, CAT analysts identified one or more public concerns. Therefore, one response may address from one to several hundred comments.

## Categories of Public Concerns

The following is a list of the general categories of public concerns identified during the content analysis process.

- 1) **Process, Planning, Policies, and Laws** includes comments on general planning considerations related to the forest plan revision. Included in the planning section are topics such as the role of interest groups, public involvement considerations, agency organization and funding, and the relation of the forest plan to other agency plans and directives
- 2) **Alternatives** includes comments regarding the alternatives detailed in the Draft EIS and suggestions that respondents offer for new alternatives
- 3) **Environment** includes comments concerning environmental issues such soils, air quality, noise, water resources, wildlife, fisheries, and vegetation
- 4) **Transportation** includes comments relating to the transportation infrastructure on National Forest System lands, including road building, maintenance, and decommissioning; and trails
- 5) **Recreation** includes comments addressing the various recreational issues and opportunities on National Forest System lands
- 6) **Special Designations and Lands** includes comments relating to special land designations on the forest including roadless areas, wilderness areas, and wild and scenic river designations; and comments focusing on land ownership, land exchanges, and right-of way issues
- 7) **Natural Resources Management** includes comments relating to the various natural resources and resource management related activities that take place on National Forest System lands including timber harvest, fire management, mineral resources, and utility facilities
- 8) **Social and Economic Values** includes comments relating to the social and economic values provided by and impacted by National Forest System lands.

## OVERVIEW OF PUBLIC COMMENTS

Public comments on the Daniel Boone National Forest DEIS and Proposed Revised Forest Plan were far-reaching, often highly detailed, and represented a wide range of values and perspectives. Given the wide range of values and perspectives, only broad generalizations are possible in this overview.

Below is a summary of the comments in each section regarding the Daniel Boone National Forest DEIS and Proposed Revised Forest Plan.

### **Process, Planning, Policies, and Laws**

The Process, Planning, and Policy section contains comments associated with the forest plan revision and the relationship between the plan revision and current agency policies, directives, and laws. Individuals commenting on the Alternatives Section offer critiques of the agency-analyzed alternatives as well as suggestions for new alternatives. In the next section, commenters offer a wide range of views on the environmental values of National Forest System lands and how the agency can best protect these resources.

Regarding general planning, some respondents ask the Forest Service to make statements of goals, objectives, and standards more specific and quantifiable. Some commenters express concerns about using the Content Analysis Team to analyze public comment. Commenters also state that the Forest Service should consult more with the U.S. Fish and Wildlife Service to comply with the Endangered Species Act. The Army National Guard comments that the Forest Service should ensure that the military has continuing access to forest land. The role of interest groups, ranging from environmentalists to industry, generated some public comment. While some respondents say that environmental groups have too much influence on Forest Service actions, others write that industry unduly influence agency decisions.

Some respondents recommend that the Forest Service provide meaningful opportunities for citizen involvement in National Forest System land decisions, and provide adequate information to the public. Respondents ask that the Forest Service conduct additional public meetings, and that the comment period be extended.

Some writers state that the Forest Service should use the best available science, including peer-reviewed studies and review by independent scientists. Some respondents say that the maps included with the revised forest plans should provide more detail and be of quality. Commenters write that the Forest Service should increase funding and staffing for land acquisition programs and enhance public education for heritage programs. Respondents also write that the Forest Service should use clear and precise language in the proposed plan and make specific technical and editorial changes to plan language. Some commenters say that the Forest Service should ensure consistency between the forest plan and a number of laws, policies, and directives. Some writers also say that the plans are in violation of NEPA because they do not consider an adequate range of alternatives, analyze cumulative impacts or all viable alternatives, do not disclose data and analysis, or do not provide a fair and full discussion of significant information.

### **Alternatives**

Several commenters write that the Forest Service should develop a wider range of reasonable alternatives, including a zero-cut alternative for no timber harvesting on national forest system land.

Various writers state that the Forest Service should create an alternative that blends B-1 with C-1 and implement an alternative devised by the Nature Conservancy. Numerous writers state that the Forest Service should implement the alternative developed by the Kentucky Conservation Community.

Commenters also state that the Forest Service could achieve a better analysis of alternatives by differentiating activities and variables for each alternatives. Some writers urge the Forest Service to implement Alternative B-1 because it reduces commercial resource activity and benefits the ecosystem. Other commenters state that the Forest Service should implement Alternative C because it emphasizes ecosystem integrity, ensures recreational access, and allows timber harvest to benefit bird habitat, early successional species, and ecological processes. Numerous respondents offer multiple reasons why the preferred alternative should not be implemented.

## **Environment**

In Chapter 3, numerous respondents ask the Forest Service to protect National Forest System lands, the environment, and flora and fauna.

Many writers say the Forest Service should conduct better environmental analysis of multiple management actions and non-forest lands in the analysis of cumulative effects. Writers comment that the Forest Service should develop buffer zones based on science while others say that the Forest Service should specify strong protections in sensitive areas such as for caves, cliffhines, and riparian areas. Other respondents comment that the Forest Service should ensure that buffer areas allow the use of management equipment and travel to facilitate management of these and other areas. Some respondents state that the Forest Service should monitor and protect soils and better address stream sedimentation by establishing quantitative standards and better analyzing the effects of management actions.

Writers remarking that the Forest Service should do more to improve air and water quality as well as protect watersheds, riparian areas, and wetlands. Some also state that the Forest Service should clean up trash sites and illegal dumps. Commenters also state that the Cumberland River Watershed as well as water bodies listed under the Clean Water Act 303 (d) should be managed under Watershed Restoration or Aquatic Habitat prescriptions to reduce sediment and pollutant inputs. Some writers say that the Forest Service should not implement management restriction based on ephemeral streams. Others, however, believe the agency should expand riparian corridor widths for perennial, intermittent, and ephemeral streams as well as for lakes, ponds, and wetlands. Riparian corridor protection should be extended to the entire channel network, they recommend, including headwater streams and transitions zones, to protect riparian processes. Comments vary as to the degree of protection offered by various buffers.

While some commenters say the Forest Service should specify strong measures such as no timber harvest for multiple environmental reasons, other writers say that the Forest Service should not classify riparian acreage as unsuitable for timber production because timber harvest in these zones can benefit recreation and wildlife as well as provide revenue.

Respondents commonly state that the Forest Service should maintain the viability of federally listed, locally rare, and native species, and should enhance habitats and provide detailed, binding standards and monitoring requirements. Commenters also say that the Forest Service should consult more with the U.S. Fish and Wildlife Service regarding recent research and its implications for monitoring and species recovery plans as well as for the overall forest plan. Respondents often comment that the

Forest Service should expand the number and types of species designated as management indicator species because the current list consists of common species, and species should include those for interior and old-growth forests. Management indicator species, some suggest, should cover all landscape and habitat types, species should reflect management activities, and should include sensitive species and a variety of taxonomies and communities. Respondents commonly state that the Forest Service should monitor reptiles, amphibians, mussels, fish, cave species, aquatic macro-invertebrates, and rare species, with a variety such as that listed in the 1996 Citizens' Alternative. Writers commonly state that the Forest Service should conduct full surveys and inventories of species and their habitat to ensure species viability, to comply with National Forest Management Act, and because viability is determined by more than the presence of forest types.

Some writers comment that the Forest Service should implement the Habitat Diversity Emphasis Area prescription to maintain a diversity of wildlife species. Other respondents assert that the Forest Service should not implement the Habitat Diversity Prescription Area because early successional habitat occurs naturally via disturbance processes and such habitat is widely available on private lands. They also challenge the scientific basis for such a prescription area. Respondents comment that the Forest Service should prevent fragmentation and habitat loss to protect sensitive species as well as to promote wildlife movement and genetic diversity. Some writers say that the Forest Service should conduct viability analysis for black bear and elk, and analyze the effects of management actions on these and other demand species. Respondents also frequently state that the Forest Service should conduct realistic assessments of aquatic species viability and watershed health because erroneous assessments for rare aquatic species have been made. They also urge development of management strategies to protect and restore aquatic habitats, such as designating these areas as Watershed Restoration Areas or Aquatic Habitat Areas. Further, writers say that the Forest Service should retain large woody debris to provide habitat, nutrients, and stream structure, and restore native communities.

## **Transportation**

The Transportation Section contains comments from respondents who advocate the decommissioning of existing roads and the prohibition of new road building on the forest, while some respondents point out the importance of forest roads and trails and the need to maintain this infrastructure.

Some writers say that the Forest Service should develop a roads inventory, establish standards for low road densities for management prescriptions, road standards, standards that reduce fragmentation, and standards to close any road that creates adverse environmental effects. Some respondents assert that the Forest Service should limit any road building, decommission "unneeded" roads, and analyze the effects and cumulative effects for any road construction. Some writers comment that the Forest Service should better maintain forest trails, post allowed and prohibited trail uses, implement education and enforcement efforts for trail use, and specify trails that will be closed.

## **Recreation**

Comments relating to Recreation are quite varied. Several recreational activities on National Forest System lands, including motorized recreation, rock climbing, and recreation facility development, received attention and considerable comment from the public.

Some respondents say that the Forest Service should designate the Clifty Wilderness Area and Wolfpen Roadless Area as primitive under the Recreation Opportunity Spectrum because their clifflines and terrain establish distinct physical boundaries. Some respondents comment that the Forest Service should emphasize recreation instead of timber harvest, while analyzing the effects of recreational activities and limiting activities that create negative impacts on natural resources and other recreational experiences. Some respondents comment that the Forest Service should emphasize low-impact recreation, high-quality recreation, quality backcountry experiences and ecotourism.

Respondents state that the Forest Service should analyze the effects of off-highway vehicle use on national forest lands, with numerous respondents commenting that the Forest Service should limit or prohibit motorized recreation on national forest land because of effects on other forest goals, environmental effects, lack of agency monitoring and control, and effects of trespassers onto private property. In contrast, several writers advocate that the Forest Service should provide a spectrum of motorized recreational opportunities to better meet users' needs for more trails, longer trails, and connections between trails. There were requests associated with specific trails reflecting the desire for such trails in southeast Kentucky, the demand for motorized recreation, and the economic benefits generated by motorized users. Forest Service maintained trails would reduce illegal riding and spread use over a wider area to reduce environmental effects, it was suggested.

Writers say that the Forest Service should specify rock climbing goals, objectives, and standards in the cliffline community prescription area to reduce confusion and make regulations simpler for rock climbers to understand. Writers also offer recommended that the Forest Service should specify standards for development or modification of bouldering routes as well as for vegetation removal. They suggest provisions that would allow the maintenance or replacement of fixed anchors within existing climbing areas and the development of a quota system for overuse. Respondents state that the Forest Service should develop a climbing management plan and provide a full spectrum of climbing opportunities and manage climbing on an area basis (instead of a route-by-route approach) while providing district rangers with the discretion to approve new climbing areas, and manage climbing, bouldering, and rappelling as uniquely different activities.

Commenters also say that the Forest Service should support mountain biking as well as hunting and fishing on national forest land. They request more open areas for equestrian use, grouse management, and tourism. Some respondents assert, for multiple reasons, that the Forest Service should not develop the resort lodge and golf course at Cave Run Lake; that as a site-specific project, the resort is inappropriate for the Plan. Some also say that the Forest Service should emphasize undeveloped sites as well as little-developed or conservation-oriented facilities.

### **Special Designations and Lands**

One of the more dominant themes in the special designations section is the management and recommendations for roadless and wilderness areas.

Respondents frequently state that the Forest Service should recommend additional forest land as wilderness and add land to designated roadless areas because the remaining Eastern wildlands and ecosystems are underrepresented in the National Forest Wilderness Preservation System. Others write that the Forest Service should lessen the emphasis on wilderness and roadless areas. Respondents assert that the Forest Service should designate the Wolfpen Creek Area as a wilderness study area, and that it, the Beaver Creek Wildlife Management Area, and Redbird Ranger District be added to existing wilderness areas. Similarly, respondents state that the Forest Service

should support wild and scenic river designation for numerous river and creek segments such as segments of Red River, Marsh Creek, Cumberland, War Fork, Rockcastle, and Rock Creek. Commenters also write that the Forest Service should modify prescription goals, objectives, and standards for the Natural Arch Scenic Area, Reece Tract, and Red River Gorge Geologic Area to better protect these areas, and to designate Tight Hollow as a research natural area or as designated old-growth. Commenters also say that the Forest Service should expand the size of research natural areas, apply the same management to all research natural areas, and prohibit thinning, planting, and burning. Writers also state that the forest Service should incorporate the proposals by the Kentucky State Nature Preserves Commission and the Nature Conservancy to integrate old-growth plans.

Numerous respondents comment that the Forest Service should consolidate scattered parcels of forest land and expand the size of the forest. Respondents offer recommendations that the Forest Service should acquire rock climbing areas, cave habitat and adjoining surface watershed areas, coal lands near Pine Mountain, and high elevation acreage in mixed-mesophytic forests. Some writers also comment that the Forest Service should develop objectives for land acquisition, specify the cost for such acquisitions and how the acquisitions will affect resources, and suspend land exchanges.

### **Natural Resources Management**

Comments on natural resource management address timber harvest, old-growth, early successional habitat, and forest health management.

Numerous respondents assert that the Forest Service should not allow timber harvest, mining, drilling, prescribed fires, herbicides and pesticides, off-highway vehicles, roads, pipelines, or other forest incursions including commercial activities, for a variety of environmental, economic, and social reasons. Some writers state that the Forest Service should only allow resource development and harvest activities on areas that have already been altered, while others comment that the Forest Service should analyze the effects of all management actions on forest resources and surrounding private lands. Some commenters say that the Forest Service should specify vegetation management actions that will be applied to specific species to comply with NEPA.

Views vary as to guiding philosophy that the agency should follow in management actions. Numerous respondents state that the Forest Service should allow nature to take its course without human intervention; focus on environmental protection and ecotourism; manage the forest for biodiversity, habitat and species conservation and restoration, environmental benefits, and low-impact recreation; should promote healthy natural forest processes and environmental sustainability; or manage the forest as a park or preserve. Some writers advocate that the forest should be managed for specific uses, while other respondents advocate that the Forest Service should manage for multiple uses to provide sustained production of forest products and services, to support the wood products industry, and to protect wildlife, recreation, water, and scenic values. Some commenters also say that the Forest Service should manage the forest under an ecosystem management approach or by adaptive management. These respondents maintain that the Forest Service should focus on outcomes that benefit forest resources and based on monitoring.

Regarding timber harvest, some writers say that the Forest Service should conduct timber harvest to benefit forest health, wildlife, and local economies. Respondents write that the Forest Service should clearly define conditions that require timber harvest for restoration and standards that guide such harvest such that restoration is not used as a euphemism for timber harvest. Similarly, commenters assert that the Forest Service should present information regarding timber harvest in a reader-



friendly fashion so as not to mislead the public on information about timber harvest and costs, and to clearly state when timber harvest will be used. Some writers argue that the Forest Service should develop a section within the plan devoted to timber management to establish the use of timber harvest as a management tool and legitimate forest use and incorporate timber research into planning.

Respondents advance that the Forest Service should clearly define “timber harvest” and “timber production” as related to designation of land as suitable/unsuitable for timber harvest, and that such classification should vary across alternatives. Some writers say that the Forest Service should increase the amount of land designated as suitable for timber harvest to provide for habitat management, while others comment that the Forest Service should not designate lands as suitable for timber harvest, particularly near clifflines, caves, riparian areas, and rare communities, and that wide buffers should be established around such areas.

Comments vary regarding the management of forest structure. Various writers say that the Forest Service should conduct all-age management to benefit forest health, provide a broad diversity of age class distributions, develop a mosaic of forest succession, move toward older forest condition, or expand and protect old-growth and future old-growth. Some commenters say that the Forest Service should restore yellow-pine forest to benefit the red-cockaded woodpecker and shortleaf pine ecosystems, while other respondents say that the Forest Service should not conduct vegetation manipulation or manage for a single species. Writers commonly comment that the Forest Service should replant harvested areas, but not as monoculture stands, nor with non-native species. Respondents also comment that the Forest Service should establish reasonable rotation ages (e.g., 100-140 years) for different timber types. Other commenters write that the Forest Service should not conduct intensive vegetation management because forests in the region were historically characterized by large tracts of interior forest land. Some commenters write that the Forest Service should clearly specify that timber harvest is appropriate within designated management prescriptions and prescription where consistent with area objectives. Other writers comment that the Forest Service should restrict timber harvest in sensitive areas.

Respondents commonly state that the Forest Service should develop specific criteria for old-growth identification, conduct inventories of old-growth, develop plans for managing old-growth, and protect and expand the amount of old-growth and future old-growth to provide for healthy ecosystems, species diversity, and system stability; and to benefit recreational users and future generations. Respondents also frequently comment that the Forest Service should use the analysis of old-growth and natural areas conducted by the Nature Conservancy and Kentucky State Nature Preserves Commission for designating old-growth. Some writers comment that the Forest Service should position old-growth and future old-growth adjacent to areas such as wilderness to provide large blocks of undisturbed forest, minimize edge, and to maintain old-growth attributes, while others point to the need for minimum size areas, linkages among areas, and designation of the White Oak and Sinking Creek areas as old-growth stands. Writers commonly state that the Forest Service should manage old-growth stands similar to wilderness and prohibit the use of burning, thinning, and timber harvest or other ground-disturbing activities. Some writers say that the Forest Service should not manage the forest for old-growth but instead should allow old-growth to float across the landscape with longer rotation ages because old-growth will affect forest diversity, increase the frequency of catastrophic events, and because pre-European settlement conditions contained understories of savannah habitat where trees were sparse.

Some commenters write that the Forest Service should increase early successional forest habitat to maintain flora, fauna, and to benefit wildlife habitat and hunting. Numerous respondents say that the Forest Service should analyze and disclose the amount of early successional habitat created by natural disturbance, and rely on natural disturbance for the creation of habitat diversity because such disturbance is natural and dynamic and artificially created habitat may be excessive.

Some respondents say that the Forest Service should allow commercial timber harvest across the forest to benefit wildlife. Those supporting timber harvest say that the Forest Service should conduct silvicultural applications and vegetation management because studies have shown that these management actions can occur without negative effects. In contrast, other writers frequently state that the Forest Service should not allow commercial timber harvest or timber harvest at all, because of multiple environmental, economic, and social reasons. Some writers comment that the Forest Service should analyze timber harvest on private land (within the forest, locally, and regionally), and the effects of the timber program on each alternative to comply with NEPA.

Some writers say that the Forest Service should conduct timber harvest to comply with law, ensure a supply of timber, provide jobs and economic benefits to Eastern Kentucky, and to generate revenue for various purposes. From an alternative perspective, respondents commonly state that the Forest Service should not conduct timber harvest because of social benefits provided by the forest, the forest contains a small percentage of the timber within the state; timber has greater value as natural habitat for future generations; and because recreation, tourism, and environmental benefits generate more revenue and public benefits than timber harvest. Respondents also frequently write that the Forest Service should not subsidize timber harvest, roads for timber harvest, and replanting.

Numerous respondents question the adequacy of various analyses. Respondents state that the Forest Service should ensure that the Continuous Inventory of Stand Conditions (CISC) data matches ground conditions and accounts for management actions and natural disturbances because SPECTRUM analyses and results are suspect. Some writers say that the Forest Service should provide a scientific basis for combining Forest Inventory Assessment (FIA) data with CISC and using FIA plots from non-forest lands. Writers also comment that the Forest Service should have analyzed additional factors, as recommended, and should disclose full descriptions and limitations of SPECTRUM, financial analyses, Forest Vegetation Simulation, Presuppose, and SETWIGS because methods appear to lack validity.

Some writers say that the Forest Service should increase the allowable sale quantity to maintain forest health and benefit communities, maintain appropriate age class distributions, and increase recreational access and opportunities. Other respondents comment that the Forest Service should reduce the allowable sale quantity because current harvests are unsustainable.

Regarding harvest methods, respondents provide comments of various methods that the Forest Service should or should not use. Some writers say that the Forest Service should modify cliffline standards to allow the use of equipment and timber harvest, and conduct harvest in blocks ranging from 5-40 acres, as recommended. Some writers advocate that the Forest Services should use clearcuts to benefit wildlife and habitat while other respondents state that the Forest Service should not conduct clearcuts because of environmental effects. Some writers advance that the Forest Service should use selective timber harvest and single tree selection methods. Views also contrast that the Forest Service should/should not use shelterwood harvest nor seed tree production because of multiple environmental effects. Some writers comment that the Forest Service should change

rotation ages to about 100 years, and conduct detailed analysis comparing the effects of timber harvest methods.

Regarding forest health management, respondents say that the Forest Service should clarify that forest health is a desired future condition and should define forest health. Writers comment that the Forest Service should analyze and disclose factors affecting forest health. Some respondents say that the Forest Service should manage insects that attack timber to prevent spread while other writers say that the Forest Service should not manage insects because they are a natural phenomenon and not a severe problem. Respondents commonly state that the Forest Service should control invasive and non-native species and reintroduce native plants. While some writers advocate that the Forest Service should use herbicides to eradicate non-native invasive plants, other writers maintain that the Forest Service should not use herbicides or pesticides due to multiple environmental reasons, and that the Forest Service should analyze, consider, and disclose the risks of such chemical treatments to human health the environment.

Writers state that the Forest Service should acknowledge the role of fire in ecosystems, and should use fire to restore mosaic forest types and benefit federally listed species that are fire dependent. Some also state that the agency should reduce fuels and work to protect wildland-urban interface areas. Respondents commonly state that the Forest Service should not conduct prescribed fires because of increased air pollution, environmental effects, risks to endangered species, health effects to humans, threat of fire spreading to communities, public opposition, and because fire is not needed in Eastern forests. Commenters frequently state that the Forest Service should do more to analyze the effects of prescribed fire to determine the short- and long-term effects on sensitive flora, fauna, the environment, and humans; analyze cumulative effects of fuels management; and to demonstrate the need for fire.

Some respondents comment regarding the use of other forest products and the need for alternative products to wood and forest products. Some writers say that the Forest Service should promote the use of alternative products for construction and alternative fibers to reduce waste and the need for wood products.

Respondents commonly state that the Forest Service should not allow the development and harvest of mineral resources because of multiple environmental and economic effects. Some writers comment that the Forest Service should specify that land subject to mining will be returned to pre-disturbance land uses and natural habitat, and provide mineral development standards to protect ecosystems and natural and special areas. Some commenters say that the Forest Service should consider alternatives that limit mineral development, and should analyze, consider, and disclose the effects of mineral development on air and water quality, underground hydrology, biological resources, cultural resources and practices, aesthetics and recreation, as well as cumulative effects. Respondents commonly state that the Forest Service should withdraw lands and prohibit mining of Federal mineral rights because of economic and ecological issues, should purchase private mineral rights under forest land, and implement restrictions on holders of private mineral rights. Writers also comment that the Forest Service should develop subsidence plans, and require vertical buffers of at least 200 feet for mining while retaining fifty percent of the coal seam to avoid changes in hydrology and subsidence. Writers also comment that the Forest Service should require an EIS for both Tract 107ab and 745. Numerous respondents state that the Forest Service should specify plans to reclaim and remediate sites, inventory inactive mines and leaching mine sites, and clean-up and restore sites. Similar issues and views are given for oil and gas development. Respondents comment that the Forest Service should not allow the withdrawal of gas or oil from the forest. Writers say that the

Forest Service should analyze, consider, and disclose effects associated with oil and gas development and hazardous materials spills. To avoid the need for such resources, several respondents comment that the Forest Service should promote sustainable energy such as solar and wind power as alternatives to coal and natural gas.

Some commenters write that the Forest Service should restrict utilities and communication sites, specify provision for placement and management, and conduct monitoring to protect water quality. Other writers comment that the Forest Service should purchase any inholding or other area any time a special use permit is issued, and should implement new goals, objectives, and standards for utility and communication corridors and sites, as specified. Similarly, writers state that the Forest Service should analyze and disclose the effects of power transmission lines and pipeline corridors, mitigation measures, and the abandonment and removal of structures.

### **Social and Economic Values**

Comments in socioeconomic section recommend that the Forest Service do more to assist local communities and economies.

Commenters frequently raise questions about the use of IMPLAN, and state that the Forest Service should conduct valid economic analyses using valid methods and reliable data and should disclose all information such as substitution effects, associated jobs, induced jobs, input-output analysis, and income and employment multipliers. Writers also that the Forest Service should acknowledge limitations of the IMPLAN model, and show analysis by each alternative and by each separate economic activity to facilitate comparison of alternatives and meaningful public comment. Some writers say that the Forest Service should manage the forest to generate the most employment and economic benefits to local communities. In contrast, respondents frequently write that the Forest Service should analyze the economic benefits of tourism and recreation and ecosystem benefits of intact ecosystems as compared to timber production. Some commenters say that the Forest Service should conduct an economic efficiency analysis to comply with the National Forest Management Act.

## Demographics of Commenters

Demographic analysis presents an overall picture of commenters: where they live, their general affiliation to various organizations or government agencies, and the manner in which they comment. The database CAT uses contains public comment organized under subject categories and demographic information. This kind of database can be used to isolate specific combinations of information about public comment. For example, a report can show public comment from certain geographic locations or show comments associated with certain types of organizations. Thus demographic coding, combined with comment coding, allows managers to use the database to focus on specific areas of public concern linked to geographic area, organizational affiliation, and response format.

The number of responses on the Daniel Boone National Forest Proposed Plan Revision is as follows:

	469	original responses
	87	organized campaign responses with additional comments
<b>Subtotal</b>	<b>556</b>	<b>responses containing original text</b>
	+625	organized campaign responses (forms)
<b>Total all responses</b>	<b>1181</b>	

It is important to recognize that the consideration of public comment is not a vote-counting process in which the outcome is determined by the majority opinion. Relative depth of feeling and interest among the public can serve to provide a general context for decision-making. However, it is the appropriateness, specificity, and factual accuracy of comment content that serves to provide the basis for modifications to planning documents and decisions. Further, because respondents are self-selected, they do not constitute a random or representative public sample. The Administrative Procedures Act and Forest Service policy encourage all interested parties to submit comment as often as they wish regardless of age, citizenship, or eligibility to vote. Respondents may therefore include businesses, people from other countries, children, and people who submit multiple responses. Therefore, caution should be used when interpreting the numbers provided in this report. While demographic information can provide insight into the perspectives and values of respondents, it does not necessarily reveal the desires of society as a whole. All input is considered and the analysis team attempts to capture all relevant public concerns in the analysis process.

CAT identifies several categories for demographic purposes. Responses are the individual letters, postcards, emails, etc., received. Respondents are the individual response writers. Signatures refer to the people who signed these individual responses. The number of signatures may be greater than the number of responses as there may be more than one signature per response. Likewise, the number of total responses may be larger than the number of total respondents due to multiple submissions by the same respondents. CAT determines the number of responses received for a given project, the number of respondents, and the number of signatures.

The following demographic tables are based on the 556 original responses.

## GEOGRAPHIC REPRESENTATION

Geographic representation is tracked for each response. Table I - 1 displays, by origin, the number of responses and signatures. Responses were received from 34 states and 3 foreign countries. Note that 518 responses did not indicate geographic information.

**Table I - 1. Number of Responses and Signatures by Origin**

<b>State<sup>27</sup></b>	<b>Number of Responses</b>	<b>Number of Signatures</b>
Alabama	1	1
Arizona	1	1
Arkansas	2	2
Colorado	2	2
Florida	2	2
Georgia	4	4
Idaho	1	1
Illinois	6	2,669
Indiana	16	28
Kansas	1	1
Kentucky	407	431
Michigan	2	2
Mississippi	1	1
Missouri	2	2
Montana	2	2
New Mexico	1	2
North Carolina	3	3
Ohio	13	13
Pennsylvania	5	5
South Carolina	2	2
Tennessee	9	9
Vermont	1	1
Virginia	5	5
West Virginia	2	2
Wisconsin	2	2
Response submitted by Multiple States	2	4
Anonymous/Unknown	61	68
<b>Total</b>	<b>556</b>	<b>3261</b>

<sup>27</sup> States with no responses were omitted from table.

## ORGANIZATIONAL AFFILIATION

Organizational affiliation is tracked for each response. Table I - 2 displays, by organization type, the number of responses and signatures. The first box indicates respondents who wrote on behalf of themselves or those whose affiliation was unclear.

**Table I - 2. Number of Responses and Signatures by Organization Type**

<b>Organization Type</b>	<b>Number of Responses</b>	<b>Number of Signatures</b>
Business	1	1
Civic Group	0	0
County Agency/Elected Official	2	2
Federal Agency/Elected Official	5	6
Government Employee/Union	0	0
Individual	501	538
Mechanized Recreation	0	0
Mining Industry	0	0
Motorized Recreation	3	3
Multiple Use or Land Rights Organization	2	2
Non-Motorized/Non-Mechanized Recreation	1	1
Oil, Natural Gas, or Coal Industry	0	0
Other	3	3
Place-Based Group	0	0
Preservation/Conservation Organization	20	2688
Professional Association/Society	2	2
Recreation/Conservation Organization	6	7
Regional/Other Government Agency	0	0
Religious Group	0	0
State Agency/elected Official	3	3
Timber or Wood Products Industry	2	2
Town/City	0	0
Tribal	1	1
Utility Industry	2	2
Single Responses signed by Multiple Organizations	2	4
<b>Total</b>	<b>556</b>	<b>3,265</b>

## RESPONSE TYPE

Table I - 3 displays, by response format, the number of responses and signatures. The majority of responses received were original letters, followed by form letters, and then resolutions.

**Table I - 3. Number of Responses/Signatures by Response Type**

<b>Response Type</b>	<b>Response Type</b>	<b>Number of Responses</b>	<b>Number of Signatures</b>
1	Original Letter	469	3,169
2	Form plus	87	96
3	Resolution	0	0
4	Action Alert	0	0
6	Public Meeting Comment Form	0	0
<b>Total</b>		<b>556</b>	<b>3,265</b>

## DELIVERY TYPE

Delivery types are also tracked for each response received on the project (Table I - 4). Responses were received via postal or commercial mail, email, facsimile machine, and hand delivery.

**Table I - 4. Number of Responses/Signatures by Delivery Type**

<b>Delivery Type Code</b>	<b>Delivery Type</b>	<b>Number of Responses</b>	<b>Number of Signatures</b>
E	Email	192	213
F	Fax	19	20
H	Hand delivered	1	1
M	Mail	344	3,301
T	Telephone	0	0
<b>Total</b>		<b>556</b>	<b>3,265</b>



## SUMMARY OF PUBLIC CONCERNS WITH AGENCY RESPONSE

### Process, Planning, Policies, and Laws

#### GENERAL PLANNING PROCESS

**1. Public Concern: The Forest Service should provide a quantified, site-specific approach to accomplish desired goals. The Forest Service should improve the specificity of objectives and standards.**

**Response:** As explained in Chapter 1, the Plan is a programmatic document providing general direction for the future of the Daniel Boone National Forest, and therefore is not supposed to give site-specific direction. Site-specific actions are identified through an implementation strategy and documented in each project plan developed under the direction of the Revised Forest Plan. We have made minor corrections in some objectives and standards; however, we believe that the forestwide and prescription area objectives and standards are appropriate for a Forest programmatic document.

**2. Public Concern: The Forest Service should attach specific objectives to each goal in the forest plan.**

**Response:** Goals reflect long-term priorities. Goals help guide agency actions, even if no specific objectives are attached. Lack of a specific objective does not mean that action will not be taken toward fulfillment of the goal. For example, justification for a site-specific project could cite a goal even if no objective had been stated in the Plan. The introduction to Chapter 2 gives further explanation concerning the use of goals and objectives.

**3. Public Concern: The Forest Service should develop language that enforces plan goals, objectives, and standards.**

**Response:** The plan states that adherence to standards is “mandatory” (Chapter 2, Forestwide Direction). No exception can be made to a standard unless the Revised Forest Plan is amended, a process that requires public involvement and environmental analysis. Objectives give purpose and need for actions that the Forest Service should take during the planning period toward achieving goals and Desired Future Conditions. Factors such as funding, new legislation, natural occurrences, e.g. drought, flooding, blights, pests, etc., may hinder efforts to achieve goals and objectives.

**4. Public Concern: The Forest Service should correct inconsistencies between planning objectives and prescriptions, objectives and prescriptions across areas, and inconsistencies with overall forest objectives.**

**Response:** While the commenter did not cite specific inconsistencies, changes have been made where we have discovered inconsistencies. The prescription area strategy was followed in part to accommodate the diversity of needs and natural conditions found on the Daniel Boone. Prescription areas allow pursuit of a worthwhile objective in a localized area when that objective might not be appropriate Forestwide. Monitoring is an integral part of the Revised Forest Plan and plan amendments will be made if problems arise in conflicting direction.

**5. Public Concern: The Forest Service should identify and provide a summary of the various laws, policies, and directives that drive development of the forest plan.**

**Response:** The Forest Service has a great variety of statutory mandates to fulfill. Appendix B of the Plan contains 21 pages listing statutes with brief explanations.

**6. Public Concern: The Forest Service should specify standards that fully express the goals and objectives for each resource.**

**Response:** Goals and objectives drive the purpose and need for activities. Standards provide protection to resources from undesirable effects by constraining or limiting such activities. However, the Plan's standards are designed to complement the entire array of goals and objectives, and must include practical "flexibility" in the achievement this array.

**7. Public Concern: The Forest Service should attach conservation targets and objectives to defined areas on the ground.**

**Response:** This is precisely what the Plan does. Management will vary in different areas of the Forest and within prescription areas based upon the unique qualities of each site managed.

**8. Public Concern: The Forest Service should clearly define desired future conditions (DFC) and embody ecosystem protection, restoration, and compatible recreation.**

**Response:** We believe that the DFCs have been clearly identified and explained. Ecosystem protection, restoration, and compatible recreation are provided for throughout the plan.

**9. Public Concern: The Forest Service should demonstrate the need for change for certain (e.g. MIS) changes from the existing plan.**

**Response:** The Forest 5-year review of the Forest Plan recommended adjustments to the MIS list; this need was still valid and was incorporated into the Analysis of the Management Situation. There has been no change in this need since the AMS.

## RELATIONSHIP WITH OTHER AGENCIES

**10. Public Concern: The Forest Service should consult with the Eastern Shawnee Tribe if Indian skeletal remains or objects are discovered during construction.**

**Response:** Project-specific consultation with appropriate tribes is beyond the scope of the Forest Plan. Existing laws (such as the Native American Graves and Repatriation Act and National Historic Preservation Act) provide for consultation with tribes. We will continue to work with the Eastern Shawnee Tribe as needed.

**11. Public Concern: The Forest Service should consult with all Indian tribes, whether federally recognized or not.**

**Response:** The Forest Service Mission includes "listening to people and responding to their diverse needs in making decisions." We will continue to work with all cooperators and interested parties, including those federally recognized tribes. Law requires consultation with federally recognized tribes. Beyond that, other tribes can participate in the planning process similar to any individual, organization, or agency.

**12. Public Concern: The Forest Service should follow appropriate procedures and provide copies of the land and resource management plan and NEPA documents to the U.S. Department of Interior.**

**Response:** Enclosure 4 of the department's comment letter was not received before the close of the Draft comment period. Cooperating Agencies within the U. S. Department of the Interior were provided copies and briefings by the Daniel Boone National Forest as requested. Enclosure 4 will be followed with the release of the Final Plan and EIS.

**13. Public Concern: The Forest Service should acknowledge existing special use permits issued to the Army National Guard, and specify provisions for issuance of future special use permits, as recommended. The Forest Service should modify plan text, as recommended, to specifically allow military training.**

**Response:** Specific memoranda of agreements or special use authorizations are not addressed in this programmatic document. Clarification has been made where appropriate.

## ROLE OF INTEREST GROUPS

**14. Public Concern: The Forest Service should bring various interest groups together in the planning process.**

**Response:** Every effort was made to include interested groups and individuals. The Forest has carried out a collaborative process in determining what the public wants to see in this plan. Issues were discussed openly and debated at a variety of times and places. Public involvement efforts are summarized in Appendix A of the FEIS.

**15. Public Concern: The Forest Service should not allow environmental groups to overly influence the forest plan revision. The Forest Service should not manage national forests in a manner that favors industry groups. The Forest Service should protect the Daniel Boone National Forest from commercial interests.**

**Response:** The responsible official (The Regional Forester in the case of this EIS) must consider comments from all interested agencies, tribes, groups, organizations, and individuals. The decision, which is documented in the Record of Decision, must be based on a determination of the Net Public Benefit of the action. The “Rationale for the Decision” in the Record of Decision documents the decision.

## PUBLIC INVOLVEMENT/COMMUNICATION

**16. Public Concern: The Forest Service should provide adequate information to the public.**

**Response:** The Draft EIS and Proposed Plan have been provided to the public for comment so that any gaps in information can be identified. We have added additional information where needed.

**17. Public Concern: The Forest Service should consider public comments carefully and accept additional comments.**

**Response:** The Forest provided many opportunities for involvement by making available the draft documents, taking comments for at least 90 days, holding meetings, and analyzing all comments. The first part of this appendix provides a summary of the process that was used to evaluate and consider public comments on the DEIS and Proposed Revised Forest Plan.

**18. Public Concern: The Forest Service should maintain opportunities for the public to engage and connect with the forest.**

**Response:** Public involvement opportunities during implementation of the Forest Plan are beyond the scope of this analysis. Public involvement will remain a part of project-level planning as required by law. We will continue to work with our cooperators and the public.

**19. Public Concern: The Forest Service should specify results of public opinion polls and surveys on Daniel Boone National Forest issues within the forest plan.**

**Response:** Public opinion polls are utilized in the analysis as appropriate. For example, the results of a recent Forest Service poll of residents living within 75 miles of the Daniel Boone National Forest are described in the socio- economic analysis (EIS, Chapt. 3) and are based upon the specific questions asked and in the appropriate context.

**20. Public Concern: The Forest Service should develop alternatives that are responsive to public concerns.**

**Response:** All comments from interested parties were considered in the development of alternatives.

**21. Public Concern: The Forest Service should use and follow public input.**

**Response:** All comments from all interested parties were considered. The preferred alternative was announced on May 8, 2003 and the 90-day comment period began on May 16. We are responding to the comments received from May 16, to August 14, 2003 at this time.

**22. Public Concern: The Forest Service should initiate a new comment period if the final plan is significantly different than the proposed plan.**

**Response:** Direction for considering and responding to comments on the Draft EIS is found in the Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. We are following that direction and do not believe that a new comment period is necessary or warranted.

**23. Public Concern: The Forest Service should not use the Content Analysis Team in Utah to analyze public comment for the Daniel Boone Forest Plan Revision.**

**Response:** Daniel Boone National Forest personnel read all of the comments and an appropriate response has been made. The Content Analysis Team is comprised of Forest Service personnel who are specifically trained in content analysis. The Content Analysis Team helped us categorize, organize, and sort the thousands of comments received during the comment period.

**24. Public Concern: The Forest Service should schedule additional public meetings on the forest plan revision in each of the communities around the forest.**

**Response:** Meetings were scheduled based upon travel distances and past public participation at public meetings. Additional details of the public involvement process can be found in Appendix A of the EIS.

**25. Public Concern: The Forest Service should extend the comment period for the Daniel Boone Forest Plan revision.**

**Response:** Direction for considering and responding to comments on the Draft EIS is found in the Regulations for Implementing the Procedural Provisions of the National Environmental Policy Act. The Forest provided many opportunities for involvement by making available the draft documents, taking comments for 90 days, holding open houses around the eastern half of Kentucky, and providing numerous briefings to various interests. We do not believe that an extension of the comment period was necessary or warranted.

## COLLABORATIVE PLANNING

**26. Public Concern: The Forest Service should educate private landowners to utilize land use practices that complement and enhance the health of the forest and ecosystems. The Forest Service should demonstrate forestry practices that can be used by non-industrial private forest owners.**

**Response:** State and Private Forestry (S&PF) is one of the three branches of the Forest Service. In the Southern Region the State and Private Forestry Team cooperatively works with state forestry agencies to promote and support resource management and conservation in rural and urban areas.

Another branch of the USDA Forest Service, in the Southern Region is the Southern Research Station. The Southern Research Station's mission is to create the science and technology needed to sustain and enhance southern forest ecosystems and the benefits they provide.

The National Forest System is a branch of the USDA Forest Service responsible for on-the-ground land management of the National Forest System lands. Working in partnership with Research and S&PF provides opportunities to implement strategies that can then be shared with other agencies, professionals, and private landowners. This type of collaboration is expected to continue. Through the efforts of the state agencies and the branches of the Forest Service, private landowners should have at their disposal the technology and resources necessary to complement and enhance ecosystems adjoining the Daniel Boone National Forest.

**27. Public Concern: The Forest Service should balance the need of all stakeholders.**

**Response:** The EIS documents the consideration of a range of alternatives that provide different balances of resource management and public use. The Regional Forester, as the responsible official, selects the alternative that he believes provides the most appropriate balance. Please refer to the Record of Decision for the rationale for the Selected Alternative.

**28. Public Concern: The Forest Service should explain how forest planning activities were coordinated with in-holders.**

**Response:** We have added a statement to Appendix A of the FEIS that explains how adjacent landowners were notified.

**29. Public Concern: The Forest Service should better collaborate with private landowners.**

**Response:** Collaboration with private landowners is a normal part of day-to-day operations and implementation of the Revised Forest Plan. During the revision of the Forest Plan, landowners were afforded the same opportunity to be involved as other members of the public. The public involvement opportunities for this planning effort are described in Appendix A of the FEIS.

## BEST AVAILABLE SCIENCE

**30. Public Concern: The Forest Service should use the best available science for the forest plan. The Forest Service should ensure that the Riparian and Cliffline Management Prescriptions are based on sound science and Forest Service research. The Forest Service should cite non-Forest Service, peer-reviewed, scientific studies that have been conducted on the Daniel Boone National Forest.**

**Response:** We believe that the best available science was used. Peer-reviewed, scientific studies that have been conducted on the Daniel Boone National Forest and considered in preparing the EIS and Plan are cited.

**31. Public Concern: The Forest Service should have plan documents peer-reviewed by independent scientists.**

**Response:** A broad range of interested groups and individuals were requested to review our plan documents during the comment period. Several scientists outside of the Forest Service responded.

**32. Public Concern: The Forest Service should provide a scientifically accurate picture of current forest conditions.**

**Response:** We believe that the best available data was used to provide a reasonable picture of the forest, as required to compare the significant effects of the alternatives.

## **ADEQUACY OF ANALYSIS**

**33. Public Concern: The Forest Service should focus more attention on the forest's role in the state and region.**

**Response:** Attention was given to the Forest's role in the various physiographic regions, the proclamation area, or in other larger analysis areas appropriate for each resource or program.

**34. Public Concern: The Forest Service should provide more complete and accurate information.**

**Response:** A large volume of information is presented and addressed in the EIS for each program area and under each component of the environment. We believe we have provided the most accurate information available to us to address the issues and effects to the environment.

**35. Public Concern: The Forest Service should conduct and provide more adequate environmental effects analysis.**

**Response:** Most comments concerning this public concern asked for analysis beyond the scope of this document, which will be considered at the project level. Forestwide and prescription goals, objectives and standards create guidance and constraints that were considered in determining the significance of effects and the need to address these effects.

**36. Public Concern: The Forest Service should conduct and provide more cumulative effects analysis.**

**Response:** Cumulative effects are addressed in Chapter 3 of the EIS under the program or resource affected.

**37. Public Concern: The Forest Service should provide current data on forest vegetation.**

**Response:** The Forest's vegetation database (CISC) is updated continuously on a 10-year cycle, and as soon as possible when changes in classification are known to occur (Proposed Revised Plan, p. 3-263). There will always be some information in the database that is up to 10 years old, however. When catastrophic changes occur, such as the southern pine beetle outbreak, satellite photos and ground surveys are used to make adjustments.

**38. Public Concern: The Forest Service should explain why the Continuous Inventory of Stand Conditions is the best system for monitoring forests.**

**Response:** The Continuous Inventory of Stand Conditions (CISC) is a database that contains information about the general attributes or characteristics of the vegetation within each stand polygon. This data has been used for most ecosystem landscape planning. Additional inventories (of various design) have been used once a proposal is made for an activity. Detailed timber inventories and appraisals are required prior to timber sales. CISC (or its successor) is only one of many databases that will be helpful in monitoring (see Appendix D of the Revised Forest Plan).

**39. Public Concern: The Forest Service should ensure that Continuous Inventory of Stand Conditions data matches current ground conditions and accounts for natural dynamics.**

**Response:** As explained in the EIS (Chapter 3, Timber Production), the data was adjusted to reflect the effects of the mortality caused by the recent pine beetle outbreak. As in all data, standard error in precision and accuracy decreases with increasing sample intensity and other factors that increase costs. Depending on how the information is used, highly accurate results (higher costs) may not be necessary. CISC is a reasonable representation of ground conditions for the Daniel Boone National Forest.

**40. Public Concern: The analyses should include reasonably foreseeable natural disturbances, and consider change in revenue due to cut and leave or harvest during uneconomical periods.**

**Response:** The yield tables include, in effect, a built-in reflection of natural disturbance for those stands that receive a minor amount of disturbance. In addition, we have assumed a one percent level of natural disturbance that could cause enough damage to initiate stand level early succession. Assuming that much of this might be salvaged in the same way that has occurred in the past, historical stumpage prices should also reflect this effect. Beyond these considerations, we cannot reasonably foresee future disturbances, nor future “uneconomical” periods.

**41. Public Concern: The Forest Service should provide a scientific basis for combining Forest Inventory and Assessment (FIA) data with Continuous Inventory of Stand Conditions as well as using FIA plots from distant lands.**

**Response:** FIA plots were used to build the yield tables because it is the only large database of detailed tree-level information available for the area centered around the Daniel Boone National Forest [see FEIS, Appendix B, Forest Activity Scheduling Model (Spectrum)]. This was the best information available for these estimates.

**42. Public Concern: The Forest Service should not bias Risk Rating modeling to support analysis of timber harvest over other uses.**

**Response:** The model is based on vegetative condition (age, species composition, stand condition, and site index). Modeling took into consideration activities likely to occur that would result in change to the vegetative condition, whether or not the predicted change would occur because of logging operations.

**43. Public Concern: The Forest Service should have analyzed additional factors during Spectrum modeling.**

**Response:** Data at the level of detail that is available in the Forest’s vegetation database (CISC) is not available from adjacent private lands; therefore, Spectrum analysis of these lands would not be possible. Analysis of soils is better accomplished in other than the Spectrum model (see FEIS, Appendix B, Sediment Yield and Cumulative Effects model). Factors that were significant to the spectrum analysis were considered in that analysis.

**44. Public Concern: The Forest Service should make descriptions of Spectrum modeling reader friendly.**

**Response:** Explanations in Appendix B of the EIS are as readable as possible. Explanations for the development of yield tables and of the procedures for preparation and the running of a linear program are not simple. Linear programming is a mathematical problem-solving technique that cannot be easily explained in a brief appendix. Some understanding of the complexity of linear programming can be found at the following website: <http://www-unix.mcs.anl.gov/otc/Guide/faq/linear-programming-faq.html>

**45. Public Concern: The Forest Service should not use Spectrum modeling as an operational model because Spectrum is intended to be a strategic model and resulting numbers are questionable.**

**Response:** We are using Spectrum as a strategic model. The numbers are useful as a relative comparison between alternatives.

**46. Public Concern: The Forest Service should provide clear details as well as scientific evidence and references to support methods used in the Forest Vegetation Simulator, Presuppose, and SETWIGS for determining suitability.**

**Response:** The Spectrum model containing Forest Vegetation Simulator results (see discussion in EIS Appendix B) was used in the Stage 2 Suitability Analysis. As explained in the EIS [Chapter 3, Timberland Suitability Analysis (Stage 2)], the results of the Stage 2 analysis are used in the Stage 3 process. In Stage 3, during the formulation of alternatives, the results of the Stage 2 analysis were considered but had no bearing on the final suitability classifications. Additional discussion concerning Spectrum and timber costs and revenues has been added to FEIS in Appendix B. SETWIGS does not apply to our analysis and was not mentioned in the text.

**47. Public Concern: The Forest Service should provide details, as requested, for analysis of gross receipts and related financial analysis.**

**Response:** Average timber values were determined from the data we had available at the time of the analysis (1985-1996). "Purchaser road credits" and the "interest and penalties paid by the purchaser through the life of a sale" were not included in the estimates of the timber revenues used in the Spectrum model or the PNV calculations. The Forest Service no longer issues purchaser road credits. However, the costs of construction of timber roads were included in the Spectrum analysis. The environmental effects of timber harvesting are described in Chapter 3 of the FEIS.

## **MAPS/INVENTORIES/GEOGRAPHIC INFORMATION SYSTEMS (GIS)**

**48. Public Concern: The Forest Service should improve the detail and quality of maps included with the proposed plan and DEIS.**

**Response:** We have changed some of the maps and added additional maps. More detailed geographic information is available at the Forest Supervisor's office.

**49. Public Concern: The Forest Service should include the land ownership map associated with Objective 13.2.C.**

**Response:** Objective 13.2.C states that the map is available in the Regional Office, the Forest Supervisor's Office and each Ranger District office. If unable to visit any of these locations, a copy can be mailed upon request.



## AGENCY ORGANIZATION AND FUNDING

**50. Public Concern: The Forest Service should better integrate the different disciplines within the agency.**

**Response:** All relevant disciplines were represented on the Interdisciplinary Team. The Interdisciplinary Team met as small groups as well as a full team and with the Forest Management Team to develop the plan. Organizational structure is outside the scope of the Revised Forest Plan.

**51. Public Concern: The Forest Service should provide more funding and staffing for land acquisition programs. The Forest Service should adequately fund trail maintenance and law enforcement. The Forest Service should state that vegetation management will be accomplished through income producing utilization and that user fees will support recreation.**

**Response:** The plan does not determine staffing nor fund programs. The Plan is a programmatic planning document providing general direction for the future of the Daniel Boone National Forest.

**52. Public Concern: The Forest Service should not base the forest budget on timber harvest.**

**Response:** Although the budget determines the level of Forest Plan implementation, the budgeting process is outside the scope of the Revised Forest Plan. Timber sale preparation and administration is only one of the many individual program allocations made to the Daniel Boone National Forest each year.

**53. Public Concern: The Forest Service should disclose the costs and sources of funding for the proposed plan.**

**Response:** See Appendix B of the FEIS for estimated costs. Sources of funding will vary based on annual appropriations.

## EDITORIAL OR TECHNICAL COMMENTS/CORRECTIONS

**54. Public Concern: The Forest Service should use clear and precise language in the proposed plan.**

**Response:** Changes have been made where we have discovered a need to improve the language or clarity. Additional entries were also added to the glossaries.

**55. Public Concern: The Forest Service should make technical/editorial changes to the proposed plan, as recommended.**

**Response:** Changes have been made where appropriate for clarification. Standard 1C-Veg-2 has been reworded for clarification.

**56. Public Concern: The Forest Service should clarify the acronym “ORV.”**

**Response:** There are two common usages of this acronym. Outstandingly Remarkable Values is the basis for recommending a river for national wild and scenic river status. In most places in the text we have used the term off-highway vehicle (OHV) instead of off-road vehicle (ORV).

**57. Public Concern: The Forest Service should include the Ohio Climbers Association, Inc. on the list of businesses and organizations that received a copy of the document.**

**Response:** The FEIS has been corrected to include the Ohio Climbers Association.

**58. Public Concern: The Forest Service should provide details of management prescriptions that were excluded from the proposed plan.**

**Response:** The prescription areas not used in any alternative are not listed in the EIS. They were provided to the public at the appropriate time for the public to consider when providing input as alternatives were constructed. This information is available in the project record.

**59. Public Concern: The Forest Service should correct details on the chart in the DEIS (3-104) concerning vegetation, biological communities, and habitat associations.**

**Response:** This error has been corrected.

## **FOREST SERVICE DIRECTIVES AND POLICIES**

**60. Public Concern: The Forest Service should develop a “911” type of communication system for environmental crises.**

**Response:** Communication systems are administrative programs that are beyond the scope of a forest plan. Environmental crises that pose an immediate threat to human health and safety can always be reported through local law enforcement officials, who can contact Forest Service law enforcement officers if such contact is necessary.

**61. Public Concern: The Forest Service should make the proposed plan consistent with regional directives related to watershed management.**

**Response:** Watershed management direction in the Plan is consistent with regional direction and policy.

**62. Public Concern: The Forest Service should write Environmental Assessments in accordance with Code of Federal Regulations 219 and 1500, 16 United States Code 1600.**

**Response:** This is a legal requirement for actions subject to compliance with the National Environmental Policy Act. The two specific project proposals referenced in the full comment are not related to the plan revision.

**63. Public Concern: The Forest Service should make the proposed plan consistent with the Forest Service Manual.**

**Response:** Changes have been made in the Revised Forest Plan where errors that made it inconsistent were identified.

**64. Public Concern: The Forest Service should implement the proposed Planning Rule.**

**Response:** The plan revision process started with the 1982 planning regulations and the 1982 planning rule was used in the final development of this plan. The proposed Planning Rule has been withdrawn by the Forest Service pending its revision.

## LEGAL/ ENFORCEMENT (GENERAL)

**65. Public Concern: The Forest Service should implement and defend the final Land and Resource Management Plan.**

**Response:** We agree. It is also important to keep in mind that the Revised Forest Plan is intended to be adaptive and will be amended as the need is recognized. Chapter 5 of the Revised Forest Plan addresses how the Plan will be implemented and kept current.

**66. Public Concern: The Forest Service should punish individuals that break environmental laws.**

**Response:** People who break the law will be dealt with appropriately through our legal and administrative system.

## FEDERAL LAWS / ACTS

**67. Public Concern: The Forest Service should state that timber products will be produced in accordance with the Organic Act and Weeks Act.**

**Response:** It is not necessary for a forest plan to reiterate the law. Actions to implement the Revised Forest Plan must comply with applicable laws and regulations, as well as with the Plan itself. Appendix B of the Revised Forest Plan lists most of the statutes under which the Daniel Boone National Forest must operate. Singling out portions of only two of these many important statutes is inappropriate.

**68. Public Concern: The Forest Service should revise the proposed plan and DEIS to comply with the National Environmental Policy Act (NEPA).**

**Response:** The preparation of the Draft and Final EIS has complied with the requirements of NEPA. Cumulative effects were considered for each alternative based upon all of the standards and guidelines found in the plan and in Forest Service handbooks and manuals. In addition, a Biological Opinion has been completed for the Revised Forest Plan. Supporting documents are available.

**69. Public Concern: The Forest Service should comply with the National Forest Management Act by maintaining viable populations of species and conserving the full range of fish, wildlife, and ecological processes. The Forest Service should implement a strong Aquatic Conservation Strategy to forestall the decline of species and prevent the need to utilize the protections of the Endangered Species Act.**

**Response:** The Revised Forest Plan provides for at least the minimum habitat requirements for all species, terrestrial and aquatic, known to be present on the forest.

**70. Public Concern: The Forest Service should comply with the National Forest Management Act by addressing research questions within the proposed plan, as recommended.**

**Response:** We considered your recommendations. The Revised Forest Plan research needs are not intended to be all-inclusive. The research needs listed in the Revised Forest Plan are representative of research needs that could address the programmatic direction the Plan provides. Through monitoring of the Plan, additional research needs can be addressed.

**71. Public Concern: The Forest Service should acknowledge that the plan moves away from multiple-use management.**

**Response:** Comment noted. The Revised Forest Plan provides for an appropriate balance of multiple uses of the Daniel Boone National Forest.

**72. Public Concern: The Forest Service should manage forests for multiple uses.**

**Response:** The Revised Forest Plan complies with the Multiple-Use Sustained-Yield Act and is consistent with the agency's multiple-use mission (see Appendix B of the Revised Forest Plan).

**73. Public Concern: The Forest Service should work with the U.S. Fish and Wildlife Service regarding Forestwide standards for wildlife. The Forest Service should work with the U.S. Fish and Wildlife Service regarding monitoring of proposed, endangered, threatened, and sensitive species.**

**Response:** The U. S. Fish and Wildlife Service has been involved throughout development of the Revised Forest Plan. Consultation with the U.S. Fish and Wildlife Service is required under the Endangered Species Act. Future involvement will occur during Plan implementation through project planning. A close working relationship between the agencies is expected to continue.

**74. Public Concern: The Forest Service should initiate informal consultation with the Fish and Wildlife Service under Section 7 of the Endangered Species Act.**

**Response:** Federal law, specifically the Endangered Species Act, requires consultation with the U.S. Fish and Wildlife Service for all federally listed species, those proposed for federal listing and proposed or designated critical habitat. All federal actions on the Daniel Boone National Forest, including the Revised Forest Plan, will receive consultation as required by law. Sensitive species have no consultation requirement or status under the Endangered Species Act. Formal consultation was conducted for the Indiana bat and documented in a Biological Opinion, which is part of the process records.

**75. Public Concern: The Forest Service should include species with special habitat needs, threatened and endangered species, and locally rare species as MIS, to ensure species viability and comply with NFMA.**

**Response:** NFMA does not require us to select threatened and endangered species as MIS. We are required to *consider* them; we did and found none to be appropriate under the conditions outlined in the regulations. Selection criteria are provided in the MIS Selection Process record in Appendix B of the FEIS.

## Alternatives

### ANALYSIS OF ALTERNATIVES

**76. Public Concern: The Forest Service should explain why values for recreation and wildlife are constant across alternatives and disaggregate visitor days/expenditure and visitor days by recreation type**

**Response:** Values of recreation and wildlife were initially evaluated by activity and then aggregated for the forestwide programmatic evaluation. The differences are not significant because most of the recreation facilities are in place and will be either maintained in the future or modified to meet changing demand. Additional recreation improvements are not specifically proposed in any of the alternatives because of predicted funding levels. A site on the Morehead District has been identified as being appropriate for development of a recreation lodge and associated facilities, but any proposals that are received would undergo project-level public involvement and environmental analysis before any decision on development is made.

**77. Public Concern: The Forest Service should conduct better analysis of the alternatives.**

**Response:** Comment noted. The analysis of alternatives is consistent with the requirements of the forest planning process and is adequate for the Responsible Official to use in making a decision..

**78. Public Concern: The Forest Service should differentiate between Alternative B-1 and the other alternatives in terms of (species habitat relationship) risk rating.**

**Response:** Please see the Viability section in Chapter 3 of the FEIS. The model used determines the risk rating based on a combination of species rarity and habitat rarity. *Either* of these, or both, can elevate a species/habitat relationship to a very high, high or moderately high risk rating. In this case, the difference in habitat amount among alternatives was not enough to change the category. Species rarity for the four species involved put all alternatives at the same risk level. This is presented in the FEIS.

**79. Public Concern: The Forest Service should differentiate between Alternative B-1 and the other alternatives in terms of old-growth.**

**Response:** Old-growth is not limited by natural conditions on the ground, but it is limited in current occurrence. See Fish and Wildlife Management and Old-Growth in Chapter 2 and Vegetation Cover and Old-Growth in Chapter 3 of the FEIS for a discussion of the amount of older stands predicted on the forest in future years.

**80. Public Concern: The Forest Service should analyze the effects of the alternatives on proposed, endangered, threatened, and sensitive species.**

**Response:** Programmatic effects analysis of alternatives appears in Chapter 3 of the FEIS, and is further documented in the Biological Assessment and the Biological Evaluation, which are part of the process records and available for inspection upon request. More site-specific analysis of all effects to proposed, endangered, threatened, and sensitive species depends on individual project level analysis and consultation with the U.S. Fish and Wildlife Service.

## ALTERNATIVE B-1

### **81. Public Concern: The Forest Service should implement Alternative B-1.**

**Response:** Comment noted. The Selected Alternative is identified in the Record of Decision, along with the rationale for its selection.

## ALTERNATIVE C

### **82. Public Concern: The Forest Service should implement Alternative C because it places ecosystem integrity and protection as high priorities.**

**Response:** Alternative C and Alternative C-1 (preferred alternative) are nearly identical as far as ecosystem integrity and protection (FEIS, Chapter 2). The Selected Alternative is identified in the Record of Decision.

## ALTERNATIVE C-1 (PREFERRED ALTERNATIVE)

### **83. Public Concern: The Forest Service should not implement the proposed Plan, because the Daniel Boone National Forest is only a small portion of Kentucky's forest resources and an even smaller fraction of the total landscape. The Plan does not protect the natural forest environment and its resources; therefore consumptive use of national forest resources cannot be justified.**

**Response:** The Revised Forest Plan is designed to sustain and enhance the Forest's resources while providing for multiple human needs (Revised Forest Plan, Chapter 1, Mission of the Daniel Boone National Forest). Provision for "multiple uses" to meet "human needs" such as energy sources and raw materials has been mandated by the "people's" representatives in Congress. Environmentally sound reforestation takes place after timber is harvested on National Forest System land, which is not always the case on private land.

### **84. Public Concern: The Forest Service should implement Alternative C-1.**

**Response:** It is the preferred alternative. The Selected Alternative is identified in the Record of Decision.

### **85. Public Concern: The Forest Service should not implement the preferred alternative, because it fails to address public concerns and because the analysis is biased.**

**Response:** Public concerns have been addressed through the comparison of alternatives. No single alternative would please everyone and address all concerns. Although it could be disputed that all analysis has some bias, we are not aware of bias within the documents and have tried to be as objective as possible.

### **86. Public Concern: The Forest Service should not implement the preferred alternative, because Alternative C-1 does not adequately emphasize the role of the transportation system.**

**Response:** As indicated in Forestwide Goal 12, roads are more of a tool to help meet desired future conditions than a goal or objective for the landscape.

### **87. Public Concern: The Forest Service should not implement the preferred alternative, because it reduces public access and recreation.**

**Response:** This was not the conclusion of the EIS (Chapter 3, Recreation). Also see Forestwide objectives and Appendix C in the Revised Forest Plan.

**88. Public Concern: The Forest Service should not implement the preferred alternative, because it does not adequately respond to forest health and fragmentation issues.**

**Response:** Early in the planning process, forest health and fragmentation were identified as two of the 14 “significant issues” facing the Daniel Boone National Forest. Alternatives were developed and then evaluated according to how well they addressed all 14 issues (see FEIS Chapter 2). Alternative C-1 is preferred because it was deemed to be not only “adequate” but best overall in addressing the issues. The Revised Forest Plan gives general direction for forest health (Goal 2).

## **ALTERNATIVE E-1 / ALTERNATIVE A**

**89. Public Concern: The Forest Service should implement either Alternative A or Alternative E-1, or a combination of the two alternatives.**

**Response:** Both alternatives were considered. The Selected Alternative is identified in the Record of Decision along with the rationale for its selection.

**90. Public Concern: The Forest Service should implement Alternative E-1, because it emphasizes quality and quantity of products.**

**Response:** This alternative was considered. The Selected Alternative is identified in the Record of Decision along with the rationale for its selection.

**91. Public Concern: The Forest Service should not implement Alternative E-1, since it places an emphasis on short-term resource extraction.**

**Response:** Alternative E-1 is not the preferred alternative. The Selected Alternative is identified in the Record of Decision along with the rationale for its selection.

## **RECOMMENDATION FOR OTHER ALTERNATIVES**

**92. Public Concern: The Forest Service should consider the Kentucky Conservation Community’s Alternative.**

**Response:** All points made in this proposal were considered in the development of the range of alternatives.

**93. Public Concern: The Forest Service should provide a wider range of alternatives.**

**Response:** The range of alternatives was adequate to address the various aspects of each issue. Alternatives considered in detail complied with the mandates of the National Forest Management Act, the Multiple Use-Sustained Yield Act, and the Endangered Species Act. Chapter 2 of the FEIS describes alternatives that were considered but dropped from detailed analysis.

**94. Public Concern: The Forest Service should consider an alternative that blends Alternative B-1 with Alternative C-1, as a compromise.**

**Response:** Various ranges were considered. Evaluating an additional alternative, as proposed, would not add or detract from the comparison already presented.

**95. Public Concern: The Forest Service should adopt a new alternative: “Alternative C-2.”**

**Response:** Various ranges were considered. Evaluating an additional alternative, as proposed, would not add or detract from the comparison already presented. The suggested alternative appears to be similar to alternative C-1.

## Environment

### GENERAL ENVIRONMENT

**96. Public Concern: The Forest Service should develop buffer zones for resources based on science. The Forest Service should develop buffer zones without loopholes so that resources will be protected. The Forest Service should implement appropriate regulatory restrictions for clifflines and riparian areas.**

**Response:** We established prescription areas (management zones) rather than buffer zones. Within these management zones, the Revised Forest Plan provides specific direction to achieve the desired future condition.

**97. Public Concern: The Forest Service should compare sites and design special management areas more intensively for old-growth and rare communities.**

**Response:** Information from cooperative efforts was used to develop and consider both old-growth and rare communities. However, it was not the only consideration.

**98. Public Concern: The Forest Service should address the effects of air and water pollution.**

**Response:** Environmental consequences associated with air and water resources are addressed in Chapter 3 of the FEIS under “Air Quality” and “Soil and Water.”

**99. Public Concern: The Forest Service should provide more detail in desired future conditions, explain how uses and conditions relate to each other, describe the management of uses, and direct immediate attention, as recommended.**

**Response:** This is what we attempted to do. The desired future condition narratives provide an overview of what implementation of the associated goals, objectives, and standards should look like to visitors. These overviews are necessarily general because of the diversity of conditions encountered when implementing the management direction.

### SOILS AND SEDIMENTATION

**100. Public Concern: The Forest Service should monitor and protect soils.**

**Response:** The Revised Forest Plan, along with the Forest Service Manual and Handbooks, provide for an appropriate level of protection of soils. We cannot agree with the commenter’s definition of *Significant* as being the minimum level of change.



**101. Public Concern: The Forest Service should better address sedimentation of streams in areas to be cut.**

**Response:** Sedimentation projections at a programmatic scale are described for each alternative in Chapter 3 of the FEIS. Specific locations where activities are proposed will be determined within each site-specific analysis. Specific sediment production will be adequately addressed at that time.

**102. Public Concern: The Forest Service should provide quantitative figures for Objectives 1.6.A. and 1E-Obj-5A.**

**Response:** Stream sediment levels naturally vary based on physical and environmental factors (e.g. size of watershed, rainfall intensity). Sediment transport will be monitored (Revised Forest Plan, Appendix D – Task 49) and site-specific analysis will determine if these levels exceed what is deemed to be a normal range (or desired future condition) for each site.

**103. Public Concern: The Forest Service should explain why sediment levels don't vary by watershed and alternative.**

**Response:** The sediment levels do vary between alternatives but the species-sediment load relationship or index (SSI in the FEIS) does not change. This is disclosed in the description of environmental consequences for each alternative, found in Chapter 3 of the FEIS.

**104. Public Concern: The Forest Service should explain why active manipulation is necessary for sustaining aquatic species diversity in Alternative B-1.**

**Response:** Any active manipulation that is not for the protection of humans or a legal obligation of the Forest Service could not take place under Alternative B-1 (EIS, Chapter 3). Activities that would be legally necessary would include any that protect and maintain proposed, threatened, endangered, and sensitive (PETS) species; e.g., removal of nonnative invasive species, aquatic species re-introduction, prescribed fire, and the creation of snags and cavity trees. Manipulation that could benefit aquatic proposed, endangered, threatened, and sensitive species could include removal of non-native invasive species, addition of large woody debris to streams, stabilizing disturbed stream banks and crossings, etc.

**105. Public Concern: The Forest Service should provide data on the precision of sediment models, and provide conclusions concerning the protection of watersheds, species, and resources.**

**Response:** As indicated in the DEIS and Appendix B (Sediment Yield and Cumulative Effects Model), the model was used to provide a useful comparison between alternatives, but is (as are most models) only a broad or rough estimate of the real world. Due to the variability of watersheds as well as other geographic and fluctuating climatic conditions, it is unlikely that any sediment model will ever be extremely accurate. Conclusions concerning the comparison of all effects, which are displayed in Chapter 2 of the FEIS, will be made in the Record of Decision.

**106. Public Concern: The Forest Service should analyze and address soil stability and regeneration capacity, as recommended, for mineral development.**

**Response:** Chapters 2 and 3 of the Revised Forest Plan, along with the Forest Service Manual and Handbooks, provide for the protection of soils. The recommended analysis is beyond the scope of a programmatic document such as a forest plan. Analysis will be conducted at the project level based upon the characteristics of sites subject to the effects of a particular project.

**107. Public Concern: The Forest Service should demonstrate how prescriptions, mitigation measures, and monitoring would reduce erosion associated with habitat manipulation.**

**Response:** Chapters 2 and 3 of the Revised Forest Plan, along with the Forest Service Manual and Handbooks, provide for the protection of soils. The recommended analysis is beyond the scope of a programmatic document such as a forest plan. Analysis will be conducted at the project level based upon the characteristics of sites subject to the effects of a particular project.

**108. Public Concern: The Forest Service should explain how vegetation management relates to stabilizing banks.**

**Response:** The examples of vegetation management in the FEIS (Chapter 3) are: prescribed fire, creation of snags, planting, control of non-native invasive species, etc. Some of these would contribute directly to bank stabilization and others would not, depending on where in the “areas adjacent to aquatic habitats” the activity took place.

**109. Public Concern: The Forest Service should implement stringent regulations to stop erosion.**

**Response:** Chapters 2 and 3 of the Revised Forest Plan, along with the Forest Service Manual and Handbooks, provide for the protection of soils. Additional protections will be recommended (if needed) at the project level based upon the characteristics of sites subject to the effects of a particular project.

**110. Public Concern: The Forest Service should implement and aggressively enforce Objective 12.1.**

**Response:** It is our intent that all Objectives will be pursued. Available funding and other considerations will influence the rate of progress in achieving Objectives.

**111. Public Concern: The Forest Service should modify Objective 12.1.A and conduct unit monitoring and analysis of sediment at least every five years.**

**Response:** In conjunction with the Kentucky Watershed Management Framework the Daniel Boone National Forest has been conducting a broad scale basin-wide analysis every 5 years. Monitoring and site specific analysis may be done more frequently. Unit analysis (such as watershed or landscape) will be conducted as often as budget and personnel constraints will allow. However, it is unlikely that this will occur on less than a 10-year cycle.

**112. Public Concern: The Forest Service should designate slopes of 11-45 percent as unsuitable for timber production, especially in the riparian corridor.**

**Response:** Approximately 99 percent of the Riparian Corridor prescription area is classified as unsuitable. If any logging occurs in this prescription area it will be for the benefit of riparian and aquatic associated species. Certain steep or inaccessible areas located within the Habitat Diversity prescription area are classified as unsuitable for timber production for economic reasons.

**113. Public Concern: The Forest Service should provide details of soil acidification.**

**Response:** Recent studies on the Daniel Boone National Forest indicate that acidification is currently not a significant problem at this time. The situation could change in the future, so monitoring will continue.

**114. Public Concern: The Forest Service should modify vegetation standards regarding soils, as recommended.**

**Response:** The Revised Forest Plan, Chapters 2 and 3, along with the Forest Service Manual and Handbooks, provide for the adequate protection of soils. Additional protections will be recommended (if needed) at the project level based upon the characteristics of sites that will be affected by projects. Actions taken will provide for the long-term sustainability of the resources of the Daniel Boone National Forest. Some loss of soil productivity may occur in the effort to insure this sustainability.

**CLIFFLINES****115. Public Concern: The Forest Service should implement the Cliffline Community Prescription Area because it will benefit several federally listed species.**

**Response:** The Cliffline Community Prescription Area is part of the Revised Forest Plan.

**116. Public Concern: The Forest Service should adopt a definition of cliffline community that includes habitat quality, uniqueness, and site-specific variables. The Forest Service should conduct analysis and disclose information regarding the designation of cliffline buffers. The Forest Service should develop prescriptions for cliffline communities individually.**

**Response:** The Cliffline Community Prescription Area is established in the Revised Forest Plan as a minimum distance requirement. Forestwide observational analysis indicates that the current distances, from a programmatic standpoint, are adequate. Site-specific analysis on an individual project level will determine whether any additional mitigation is necessary to protect proposed, threatened, endangered, and sensitive species, as well as maintain microclimate or other species associated needs. This flexibility is built into the Revised Forest Plan.

**117. Public Concern: The Forest Service should prioritize cliffline sections for protection, particularly those supporting proposed, endangered, threatened, and sensitive species, and sites located in proposed natural areas.**

**Response:** From a programmatic Forestwide standpoint, all clifflines are biologically important. In site-specific cases, additional areas can be delineated for individual site occurrences of proposed, endangered, threatened, and sensitive species. Programmatically, the Significant Bat Cave Prescription Area provides additional acres of protection for these known locations.

**118. Public Concern: The Forest Service should specify how rock shelters will be protected.**

**Response:** Rockshelters occur within the Cliffline Community Prescription Area and are subject to both the Forestwide and prescription area standards. Included in these standards is protection from trampling associated with human use. Some rockshelters serve as significant hibernation sites for proposed, endangered, threatened, and sensitive bats and are included within the Significant Bat Cave Prescription Area.

**119. Public Concern: The Forest Service should modify the Cliffline prescription zone to extend 100 and 200 feet from the outer edge of cliffline-associated vegetation rather than from the dripline. Unless the effectiveness of the 100-200 foot buffer can be demonstrated, it would seem prudent to err on the conservative side.”**

**Response:** The distances that are used in the Cliffline Community prescription area have been applied in managing the Daniel Boone National Forest for over ten years. Based on field observations of existing cliffline conditions, we believe the current zone offers adequate cliffline microclimate protection.

**120. Public Concern: The Forest Service should modify DB-WLF-14 to specify cave buffers that encompass the whole watershed for each cave.**

**Response:** Site-specific analysis of individual projects is utilized to determine the potential for disturbance and the need for any addition mitigation measures.

**121. Public Concern: The Forest Service should not establish cliffline slope distances because studies have shown that management activities such as timber harvest and road building, when conducted at appropriate times of the year, have no ill effects on bats.**

**Response:** The maintenance of microclimate conditions along clifflines is important to many species in addition to bats. This was addressed in the analysis for Amendment 11 to the 1985 Plan, and we are not aware of information that would cause us to draw different conclusions.

**122. Public Concern: The Forest Service should specify habitat goals for cliffline communities and demonstrate how their designation as “unsuitable for timber harvest” would benefit species and habitat of interest.**

**Response:** Habitat goals for this prescription area are included under the Goals section. In addition, the Desired Future Condition narrative addresses the broad category of habitat goals. Vegetation management is allowed only when the purpose and need is to protect or enhance conditions for proposed, endangered, threatened, and sensitive species.

**123. Public Concern: The Forest Service should not implement the cliffline prescription because of restrictions to cable logging.**

**Response:** On a site-specific basis, cable corridors can pass through this prescription area. Standard 1C-Veg-2 has been reworded for clarification.

**124. Public Concern: The Forest Service should specify that equipment may be used in cliffline communities.**

**Response:** The maintenance of hydrologic functions in areas adjacent to clifflines is vital to maintaining stable microclimate conditions. The use of heavy equipment in these areas would adversely impact this condition. Some equipment, such as end lines, is allowed to facilitate habitat maintenance.

**125. Public Concern: The Forest Service should modify wording for 1.C. Cliffline Community.**

**Response:** The current wording of Standard 1.C-WLF-1 adequately allows for vegetation manipulation designed to meet the desired future condition of the area and provide habitat for proposed, endangered, threatened, and sensitive species.

**126. Public Concern: The Forest Service should initiate inventories and research of cliffline communities to enhance knowledge of species found there, and determine the types of canopy disturbances that have occurred in the past.**

**Response:** The adequacy of the Cliffline Community prescription area is one of the identified research needs identified in Appendix E of the Revised Forest Plan. Natural disturbance regimes will continue to occur along clifflines within the forest. Windstorms, ice, snow, and wildland fire will continue to provide a natural mosaic on the landscape; including clifflines.

**127. Public Concern: The Forest Service should set more restrictive goals, objectives, and standards, as recommended, for cliffline communities.**

**Response:** We believe the current standards associated with this prescription area provide the necessary management direction and limitations to protect and maintain the species associated with this area and their habitats. All project activity within the Cliffline Community prescription area will be based upon site-specific analysis.

## CAVES AND KARST

**128. Public Concern: The Forest Service should protect cave and karst areas. The Forest Service should designate non-bat caves, non-significant bat caves, and other karst features as rare communities.**

**Response:** Programmatic protections included within the Revised Forest Plan apply forestwide. Site-specific analysis is required for individual projects to determine the possible effects to a wide variety of forest resources, including caves. Thus, additional protective measures, as appropriate, are assigned on a project-by-project basis.

**129. Public Concern: The Forest Service should implement Goal 1.6 and its associated objectives.**

**Response:** We fully agree.

**130. Public Concern: The Forest Service should modify language of Goal 1.6 and Objective 1.6.A to specify stronger protection of cave resources and water quality.**

**Response:** The Revised Forest Plan water quality standards apply to all streams, whether or not they are sinking streams. Individual site-specific analysis will determine the degree or amount of additional protection needed, if any, on a project-by-project basis.

**131. Public Concern: The Forest Service should implement and complete the significant cave nomination and management process by 2005, and complete a cave and karst management plan by 2006.**

**Response:** We agree that this is an important issue to be addressed by the Daniel Boone National Forest. That is why it is included as a specific objective to accomplish during this planning period. Exactly when it will be accomplished, within the planning period, is a function of budget, personnel and other factors not within the scope of a forest plan.

**132. Public Concern: The Forest Service should provide analysis and details regarding special designations of cave and karst areas. The Forest Service should establish buffer zones greater than 200 feet around cave and karst areas.**

**Response:** The 200-foot buffer is a Forestwide, programmatic minimum area of cave/karst protection. Site-specific analysis will determine if more restrictive protections are needed based on the individual project location and its projected effects on the environment. For the Significant Bat Cave Prescription Area this protective zone is increased programmatic to ¼ mile. Additional standards maintain seasonal activity limitations associated with these caves.

**133. Public Concern: The Forest Service should establish a cave prescription area.**

**Response:** A Forestwide standard does provide programmatic protection for all caves. Most of the caves on the Daniel Boone National Forest are located within the Cliffline Community Prescription Area or the Significant Bat Cave Prescription Area. Site-specific analysis based on individual projects can tailor additional protective measures as necessary.

**134. Public Concern: The Forest Service should establish standards, as recommended, that prohibit activities that threaten caves and cave resources.**

**Response:** Caves and their associated biological and physical resources are protected based on second level, site-specific analysis, associated with individual projects. Additional protective measures, beyond those prescribed in the Revised Forest Plan, are applied on this site-specific basis as needed to insure adequate protection.

## AIR QUALITY

**135. Public Concern: The Forest Service should use current air quality data.**

**Response:** The description of ambient air quality in the FEIS has been updated to include monitoring years 2000-2002, the most recent data available. The 1999 emissions inventory used in the effects analyses is the most current available.

**136. Public Concern: The Forest Service should not address air pollution abatement.**

**Response:** It is true that the Forest does not directly regulate anthropogenic air pollution. The state air regulatory agency has the responsibility for controlling air pollution sources. However the Daniel Boone National Forest is involved in large interagency, regional planning efforts to improve air quality (Southern Appalachian Mountains Initiative, regional haze planning organizations). Ultimately these planning efforts will affect air quality policy and air regulations.

**137. Public Concern: The Forest Service should explain why statements of intent to improve soil quality and air quality are contained within one goal, explain why the amount of planned burning is inconsistent with improving air quality, and specify what actions that the Forest Service will implement to improve air quality.**

**Response:** These two factors of the environment were combined within one goal because neither was identified in the list of significant issues. The four air quality objectives that are included under Goals 4.1 and 4.2 give direction for action this planning period. Goal 4.2 and standard DB-Fire-3 specifically address air quality and prescribed burning. Although air quality was not identified as a significant issue on the Daniel Boone National Forest, the included direction was considered important to achieve during this planning period.

## ILLEGAL DUMPS

**138. Public Concern: The Forest Service should clean up trash sites and dumps.**

**Response:** Illegal trash sites and dumps are a blight on the landscape of the Daniel Boone National Forest. We will continue to work hard at insuring that we keep litter and dumping off of the National Forest. We have been working with the “PRIDE” program in physically cleaning up dumps, enforcing dumping laws, and educating our young people about this issue.

## WATER QUALITY

**139. Public Concern: The Forest Service should protect water quality.**

**Response:** The management direction throughout the Revised Forest Plan and especially the direction in the Source Water Protection and Riparian Corridor prescription areas is designed to protect water quality. The disclosure of environmental consequences in Chapter 3 of the EIS demonstrates that water quality will be protected.

**140. Public Concern: The Forest Service should specify how drinking water will be maintained.**

**Response:** The goals, objectives, and standards in the Source Water Protection prescription area are specifically designed to protect drinking water supplies.

**141. Public Concern: The Forest Service should work with other private, state, and federal entities and agencies to protect water quality.**

**Response:** The Daniel Boone National Forest works closely with numerous other private, state and federal agencies in an effort to protect water quality. The Daniel Boone National Forest is an active member of the Kentucky Watershed Management Framework, a coalition of agencies concerned with water quality. We also interact on a regular basis with private organizations and universities on projects that improve water quality.

**142. Public Concern: The Forest Service should specify, within the appendix, forestry best management practices that will be implemented to protect water quality.**

**Response:** The standard suggested by the commenter has been added to the Forestwide standards at DB-VEG-27. This incorporates the state Best Management Practices by reference.

**143. Public Concern: The Forest Service should have water quality monitored by a Kentucky certified lab following a state approved Quality Assurance Performance Plan, and share results with the Kentucky Department of Environmental Protection (KDEP).**

**Response:** Water quality and stream assessment data is currently shared with KDEP and the suggested sentences have been added to the narrative under Question 15 in Chapter 5 of the Revised Forest Plan.

**144. Public Concern: The Forest Service should act to provide cleaner water in the Cumberland River and remove debris.**

**Response:** We agree. Unfortunately, much of the debris and water quality problems that the commenter refers to are outside of our immediate jurisdiction. To attain the overall goal of cleaner water in the Cumberland River we work closely with other agencies that do have jurisdiction over this problem.

**145. Public Concern: The Forest Service should inventory all toxic water sources.**

**Response:** Currently toxic water sources are inventoried in cooperation with other state and federal agencies. This will continue on a project-level basis.

**146. Public Concern: The Forest Service should modify Forestwide standard DB-WLF-15 to exclude filling toxic water source pits and basins.**

**Response:** This standard (now DB-WLF-14) has been modified to include all wildlife, and to only allow filling “in an environmentally appropriate manner.”

**147. Public Concern: The Forest Service should force the creators of brine pits and oil catch basins to pay for remediation.**

**Response:** When the responsible parties are known, they are required to remediate these impacts. However, many of these sites are abandoned and standard DB-WLF-14 is intended to address such sites.

## **WATERSHED CONDITION**

**148. Public Concern: The Forest Service should provide information on sub-watersheds and specify the locations of surface water intakes, significant ground water wells, and other water supply sources located within the Daniel Boone National Forest boundary.**

**Response:** The Source Water Protection prescription area in the Revised Forest Plan identifies all the major water supply areas within the proclamation boundary. The EIS and future site-specific analysis have or will consider areas that are downstream and outside the proclamation boundary. The reason water usage was discussed for the broader Watershed Management Areas was because this was the scale for which data was available.

**149. Public Concern: The Forest Service should designate critical water supply watersheds as Management Prescription 5.C - Source Water Protection, and specify why the areas were selected and what water sources will be protected.**

**Response:** The Source Water Protection prescription area is based on the Kentucky Division of Water’s listing of Source Water Areas. A change made in the “Setting” of this prescription area reflects this. The Proposed Revised Forest Plan showed only the Source Water Protection Areas that are within the Daniel Boone National Forest proclamation boundary because they are the only ones under our jurisdiction. However, the FEIS and future site-specific analysis consider areas that are downstream and outside the proclamation boundary.

**150. Public Concern: The Forest Service should protect watersheds.**

**Response:** Federal, state and local laws (e.g. National Forest Management Act, Clean Water Act) require that aquatic resources, streams and surface waters be protected. Forest plans provide for protection of aquatic resources by identifying streams and their beneficial uses, and providing standards that protect those resources during management activities. Such standards are found in the Riparian Corridor and Forestwide standards. Further protection will be provided as needed at the project level. Forestwide standards have been developed to provide overall watershed protection during management activities.



**151. Public Concern: The Forest Service should implement a strong aquatic conservation strategy that focuses on the whole watershed.**

**Response:** In addition to Riparian Corridor management direction, Forestwide standards (Revised Forest Plan, Chapter 2) have been developed to provide overall watershed protection during management activities.

**152. Public Concern: The Forest Service should specify requirements to conduct a watershed analysis prior to initiating site-specific project planning and stipulate the framework for the analysis.**

**Response:** Watershed assessments and analysis are excellent tools for identifying priority watersheds and programming restoration work. Assessments are also useful in land management allocations and in the development of prescriptions. Watershed analyses were completed by the Daniel Boone National Forest to assess watershed condition and vulnerability. More detailed watershed analysis will be completed prior to project implementation as needed. Chapter 5 of the Revised Forest Plan also discusses watershed analysis during the implementation phase.

**153. Public Concern: The Forest Service should designate areas within the Cumberland River watershed under the Watershed Restoration or Aquatic Habitat prescription. The Forest Service should designate watersheds containing Clean Water Act 303(d) listed water bodies under the Watershed Restoration Area Management Prescription.**

**Response:** The Revised Forest Plan is in part designed to protect and restore impaired streams and watersheds. Forestwide Objective 3.0.C. directs the Daniel Boone National Forest to concentrate restoration efforts in watersheds with impaired streams. Forestwide Objective 3.0.D. directs the Daniel Boone National Forest to reduce the number of impaired water bodies. Most of the stream impairments do not come from Forest Service activities. As Table 3-53 in the DEIS shows, there is no change in the WHI from any of our proposed management activities. Note that neither the EIS nor Revised Plan specify a “Watershed Restoration” or “Aquatic Habitat” prescription area, although the Large Reservoir prescription area may address this concern.

**154. Public Concern: The Forest Service should revise management activities and prescriptions in watersheds located within the Cumberland River Management Area to minimize sediment inputs.**

**Response:** As stated on page 3-40 of the DEIS, under the specific effects for Alternative C-1, “Given the natural variability associated with stream sedimentation, it is unlikely that cumulative changes of this magnitude will be detectable on a 5<sup>th</sup> level watershed scale or change the Watershed Health Index for any of the watersheds” (including those in the Upper Cumberland River Management Area). It should also be noted that many of the stream sedimentation impacts are coming from private land that are outside of Forest Service jurisdiction. Even if the Forest Service did nothing in these watersheds over the next 10 years it would probably not significantly change the sediment load in these streams.

**155. Public Concern: The Forest Service should define “modified 5<sup>th</sup> level hydrological unit,” and provide evidence regarding comparability of watershed analysis.**

**Response:** The watershed coverage that we used for the Revised Forest Plan no longer meets national standards for mapping hydrologic units (watersheds). However, it was the best available when we started the analysis. To stay consistent with the rest of the state, we made only minor improvements to this coverage before we started. Recently, the hydrologic units have been brought into compliance with national standards. These new watersheds will be used in all future project planning. As for the results of this analysis, there is a wide range in the size of the watersheds but where appropriate the results were weighted to compensate for the size differences. Therefore, we believe the analysis is comparable.

**156. Public Concern: The Forest Service should specify the amount of acres of National Forest System land contained within each 5<sup>th</sup> level hydrological unit.**

**Response:** The size of these areas has been specified in the FEIS.

**157. Public Concern: The Forest Service should identify the miles of streams that do not support designated forest uses within each 5<sup>th</sup> level hydrological unit and provide maps.**

**Response:** A new table listing impaired stream miles by watershed has been added. A more up-to-date map can be found at the Kentucky Division of Water's website ([www.water.ky.gov](http://www.water.ky.gov)). These dynamic maps are the best source for this information, although they are continuously changing.

**158. Public Concern: The Forest Service should acknowledge impaired water bodies located within 5<sup>th</sup> level hydrological units originating on National Forest System land, as currently listed by the Kentucky Department for Environmental Protection.**

**Response:** A new table with impaired stream miles by watershed has been added to the FEIS. The list of impaired streams and their mileage change relatively frequently. To make the analysis consistent, we froze the data at the beginning of this process. That is why your list of stream names and miles may differ slightly. However, since this information is used only to compare alternatives and not as absolute numbers, it should not make a significant difference.

**159. Public Concern: The Forest Service should re-examine management prescriptions affecting Clean Water Act 303(d) listed water bodies to determine incompatibilities with objectives for water quality and resource protection.**

**Response:** This will be done during project-level analysis. Additional standards can always be added as the need arises. Changes can also be made in conjunction with the state's TMDL process, of which we are a part.

**160. Public Concern: The Forest Service should partner with state and local agencies to assist with restoration of Clean Water Act 303(d) listed water bodies.**

**Response:** Coordination with the state is currently occurring and an implementing objective was added to the Forestwide direction as Objective 3.0.D.

**161. Public Concern: The Forest Service should implement actions to address aquatic conservation needs of the region, as recommended.**

**Response:** The Riparian Corridor prescription area is designed to protect the aquatic ecosystem. This area, combined with the designation of aquatic macroinvertebrate assemblages as important monitoring indices, is expected to provide adequate protection for these important communities. All activities will be evaluated at the project level to ensure compliance with the National Environmental Policy Act and the Endangered Species Act.

**162. Public Concern: The Forest Service should establish watershed and riparian corridor standards that specify provisions to guide timber harvest as well as the construction, use, and maintenance of roads.**

**Response:** Specific road and timber harvest standards are specified in the Riparian Corridor prescription, Forestwide standards, and referenced state Best Management Practices requirements. Such standards and requirements are also stipulated in contract clauses for road construction and timber harvest. The need for additional road stabilization techniques and other use restrictions will be determined at the project level.

**163. Public Concern: The Forest Service should modify watershed management Goal 3 and objectives, as recommended.**

**Response:** Changes have been made to these goals and objectives for clarification.

**164. Public Concern: The Forest Service should add a new watershed management Goal 4 and objectives, as recommended.**

**Response:** Most of the suggested changes are the responsibility of state agencies. However, we do coordinate with adjacent landowners and other agencies through the Kentucky Watershed Management Framework. Objective 3.0.E. has been added under Goal 3 relating to coordination with state and local agencies on Total Maximum Daily Loads (TMDLs) and watershed assessments.

**165. Public Concern: The Forest Service should specify the number of watersheds for restoration and the timetable for restoration.**

**Response:** Our objective is to restore all impaired watersheds on the Daniel Boone National Forest during the planning period. However, this objective is worded loosely because it is unlikely that this can be completed due to constrained budgets and in some cases the lack of technology. We will try to expand our capabilities through partnerships and grants.

**166. Public Concern: The Forest Service should consider watershed values within the Lick Creek area.**

**Response:** This is outside the scope of the Revised Forest Plan and will be done at the project or watershed scale.

**167. Public Concern: The Forest Service should provide explanation and justification for gauging watershed impacts at an arbitrary cut-off of 18 percent (DEIS 3-19).**

**Response:** This section of the EIS has been rewritten, and reference to an 18 percent classification break has been dropped.

## **RIPARIAN AREAS AND WETLANDS**

**168. Public Concern: The Forest Service should emphasize the benefits of sound riparian areas.**

**Response:** The Setting and Desired Future Condition sections of the Riparian Corridor prescription area address the aquatic portion of this area.

**169. Public Concern: The Forest Service should not implement the preferred alternative because it allows the stocking of non-native fish.**

**Response:** The management of fish and wildlife resources is the responsibility of the state government. The Daniel Boone National Forest works cooperatively with state agencies but the decision of what and where to stock is theirs.

**170. Public Concern: The Forest Service should provide greater protection for riparian areas and perennial streams.**

**Response:** Protection is provided in the Revised Forest Plan for streams, lakes, aquatic resources, wetlands, and floodplains (see Riparian Corridor Prescription). Specific standards are prescribed in the Riparian Corridor Prescription and Forestwide standards.

**171. Public Concern: The Forest Service should specify that riparian corridors are managed to retain, restore, and enhance inherent ecological processes.**

**Response:** The goals in the Riparian Corridor prescription area are aimed at restoring and enhancing the inherent ecological processes and function of the associated aquatic, riparian, and upland components. The Revised Forest Plan addresses improving impaired streams under Forestwide Goal 3.

**172. Public Concern: The Forest Service should implement Riparian Corridor Prescription 1.E.**

**Response:** This prescription area is in the Revised Forest Plan.

**173. Public Concern: The Forest Service should clarify Riparian Corridor Prescription 1.E. to specify that widths in Table 3 - 1 of the Proposed Plan Revision are required minimums.**

**Response:** The Setting section of the Riparian Corridor prescription area has been so modified.

**174. Public Concern: The Forest Service should analyze and disclose information regarding the establishment of riparian corridor widths.**

**Response:** Standard DB-VEG-27 has been added to the Forestwide section to require that activities “must implement applicable Kentucky Rules and Regulations for Water Quality Control and Kentucky’s Best Management Practices (BMPs) for Forestry.” Wording similar to this has also added to the Setting section of the Riparian Corridor prescription area.

**175. Public Concern: The Forest Service should clarify the definition of “riparian corridor” to provide specificity regarding stream presence.**

**Response:** The “riparian corridor” definition in the glossary has been modified. The “riparian area” definition also has been modified. The combination of these two definitions is important in understanding the Riparian Corridor prescription area.

**176. Public Concern: The Forest Service should better define “other perennial water bodies.”**

**Response:** This definition has been clarified in the Revised Forest Plan and FEIS.

**177. Public Concern: The Forest Service should define zones around channeled ephemeral streams and specify how zones are protected; should specify Forestwide standards to protect ephemeral streams as recommended; or include ephemeral streams in the riparian corridor prescription.**

**Response:** Scoured ephemeral streams have now been provided protection in several ways, such as Forestwide Goal 3.2, and standards DB-ENG-4 and DB-REC-7; they are no longer included in the Riparian Corridor prescription area (see Revised Forest Plan). Ephemeral streams do not have riparian characteristics and, therefore, are managed and protected with streamside management zones (see Goal 3.2). Because of their characteristics (i.e. periodic response to stream flow and uncertain identification criteria) specific guidance for management of ephemeral streams is more appropriate at the Forestwide level.

**178. Public Concern: The Forest Service should not implement management restrictions for ephemeral streams.**

**Response:** Our assessment of aquatic resources has shown that these areas are important to the overall health of stream ecosystems.

**179. Public Concern: The Forest Service should expand riparian corridor widths for intermittent streams to protect these important resources.**

**Response:** Protection is provided in the Revised Forest Plan for all streams, lakes, aquatic resources, wetlands, and floodplains (see Riparian Prescription and Forestwide direction). Riparian Corridor widths were based on an assessment of aquatic resources conducted for the Daniel Boone National Forest in 2001, input from specialists in the Forest Service Southern Region, research findings, monitoring data, current literature recommendations, and Daniel Boone National Forest professional expertise.

**180. Public Concern: The Forest Service should protect the entire channel network, including the headwater streams and transition zones.**

**Response:** Protection is provided in the Revised Forest Plan for all streams, lakes, aquatic resources wetlands and floodplains (see Riparian Prescription and Forestwide direction). Riparian Corridor widths were based on an assessment of aquatic resources conducted for the Daniel Boone National Forest in 2001, input from specialists in the Forest Service Southern Region, research findings, monitoring data, current literature recommendations, and Daniel Boone National Forest professional expertise. Further protection will be considered and prescribed as needed when projects are developed. Ephemeral streams do not have riparian characteristics and therefore are managed and protected with streamside management zones. Because of their characteristics (i.e. periodic response to stream flow and uncertain identification criteria), specific guidance for management of ephemeral streams is appropriately developed at the forest level. Standard for managing ephemeral streams are included in the Forestwide standards.

**181. Public Concern: The Forest Service should expand the Riparian Corridor to benefit diversity of the bird community.**

**Response:** Provisions for the avian community were considered in developing direction for the Riparian Corridor prescription area. Inclusion of the 100-year floodplain focuses management on riparian attributes for all riparian habitat associated with perennial streams, even where extensive bottomland floodplains occur. The Riparian Corridor's desired future condition for riparian habitat was designed to provide an element of connectivity for the high canopy structure across the Daniel Boone National Forest, improving opportunities for species movement. Management zones designated for scoured ephemeral streams were designed to contribute to the diversity of bird communities on the forest, as well as providing for inherent ecological processes and function of the aquatic, riparian, and upland components.

**182. Public Concern: The Forest Service should not establish riparian corridor widths based on slope because of the difficulty of slope measurement in this area.**

**Response:** The table in the Setting section of the Riparian Corridor prescription area has been changed to eliminate the need for slope measurement.

**183. Public Concern: The Forest Service should establish equal buffer widths for all water bodies.**

**Response:** The 300-foot buffer is for recreation and visual reasons (e.g. proximity to lakes) rather than soil and water concerns.

**184. Public Concern: The Forest Service should conduct analysis and disclose information regarding the establishment of buffer widths, as requested.**

**Response:** Riparian Corridor widths were based on an assessment of aquatic resources conducted for the Daniel Boone National Forest in 2001, input from specialists in the Forest Service Southern Region, research findings, monitoring data, current literature recommendations, and Daniel Boone National Forest professional expertise. The table in the setting of the Riparian Corridor prescription area has been changed and the minimum distances are no longer based on slope. The 300-foot buffer in the Large Reservoir prescription area is for recreation and visual reasons (e.g. proximity to lakes) rather than soil and water concerns. Standards for managing ephemeral streams are included in the forestwide standards.

**185. Public Concern: The Forest Service should specify that at least 50 percent of canopy cover will be maintained within riparian corridors.**

**Response:** Only a small percentage of the Riparian Corridor prescription area will be harvested and it will be done to benefit riparian and aquatic associate species. If it appears that there will be a problem with stream temperatures, additional standards can be applied on a site-specific basis.

**186. Public Concern: The Forest Service should provide a scientific rationale for managing canopies in riparian and wetland areas.**

**Response:** Canopy management as outlined in the Revised Forest Plan allows for the maintenance of riparian/aquatic habitat components often created by storm events, but lessened by past management. Storm events may provide some of these habitat components and will be taken into account in site specific planning.

**187. Public Concern: The Forest Service should retain all trees within one site potential tree height of a stream to provide coarse woody debris for the stream.**

**Response:** The Riparian Corridor prescription area was designed to retain future large woody debris. The only trees that will be removed within one tree length of perennial streams will be removed to accommodate other riparian or aquatic values.

**188. Public Concern: The Forest Service should specify requirements for the amount of course woody debris and large woody debris that must be present within riparian corridors.**

**Response:** Recommendations for course woody debris are available within our internal Guidelines document. The amount is currently set at 125 pieces per stream mile. The science was deemed not strong enough to indicate the need for a standard.

**189. Public Concern: The Forest Service should not implement restrictions that prohibit the maintenance of wildlife openings and wildlife viewing areas around large reservoirs.**

**Response:** The management zone around large reservoirs was designed as a visual management zone, which may also coincide with the Source Water Protection prescription area. The objectives within these prescription areas will normally take precedence over development of habitat such as grassy openings. Maintenance of existing grassy openings will generally continue to occur for wildlife and wildlife viewing purposes unless negative effects are occurring. Site-specifically, other habitat management may be necessary. Where prescription areas overlap, the most restrictive standards will apply (e.g. 3.B-VEG-1).

**190. Public Concern: The Forest Service should establish standards for large reservoirs, as recommended.**

**Response:** Federal, state and local laws (e.g., National Forest Management Act and Clean Water Act) require that aquatic resources, streams and surface waters be protected. Standards in the Revised Forest Plan must apply equally to all conditions throughout the Forest. The standards suggested would unnecessarily restrict activities needed to meet desired future conditions. Further protection will be provided as needed at the project level. Forestwide standards have been developed to provide overall watershed protection during management activities.

**191. Public Concern: The Forest Service should not allow any new impoundments on the Daniel Boone National Forest.**

**Response:** We disagree. Impoundments may sometimes be necessary to meet desired future conditions, depending upon specific-site conditions.

**192. Public Concern: The Forest Service should create new wetlands and maintain existing wetlands.**

**Response:** Please refer to Forestwide Goal 1.2 which states, “Create and maintain water sources with a mixture of temporary/seasonal and permanent shallow water pools throughout the Forest.”

**193. Public Concern: The Forest Service should modify Forestwide standard DB-Veg-3 such that wetland restoration and waterhole projects would not be restricted.**

**Response:** DB-VEG-3 has been reworded to include only “logging or site preparation equipment” rather than all “mechanical equipment.”

**194. Public Concern: The Forest Service should restore land in the Salt Lick and Mud Lick drainages to wetlands and native prairie conditions.**

**Response:** The Morehead District land ownership adjustment map (available at the Winchester and Morehead offices) identifies the Salt Lick area for future acquisition.

**195. Public Concern: The Forest Service should identify and survey all bogs, wetlands, and riparian habitat, and detail how they are protected.**

**Response:** Riparian areas have been mapped for the whole Daniel Boone National Forest and this mapping will be confirmed during project and watershed-level analysis. Riparian associated vegetation will be analyzed during project and watershed-level planning.

**196. Public Concern: The Forest Service should document the cumulative effects of changes in riparian areas on species and resources.**

**Response:** The FEIS examines and compares the significant cumulative effects of the proposed alternatives. It does not examine historical activities and their cumulative effects.

**197. Public Concern: The Forest Service should provide clarification and specificity regarding distance requirements for disturbance activities from water.**

**Response:** This was a typographic error and has been corrected.

**198. Public Concern: The Forest Service should establish fringe buffers and secondary riparian zones.**

**Response:** We believe that the Riparian Corridor prescription area -- with its standards, goals, and objectives -- provides adequate protection for riparian zones. Additional protections may be determined to be necessary on specific sites when activities are proposed.

**199. Public Concern: The Forest Service should make riparian corridors consistent with existing best management practices, and ensure that vegetation management, habitat diversity goals and timber production mesh.**

**Response:** Riparian Corridor widths were based on an assessment of aquatic resources conducted for the Daniel Boone National Forest in 2001, input from specialists in the Forest Service Southern Region, research findings, monitoring data, current literature recommendations, and Daniel Boone National Forest professional expertise. Standard DB-VEG-27 was added to the Forestwide section requiring that activities “must implement applicable Kentucky Rules and Regulations for Water Quality Control and Kentucky’s Best Management Practices for Forestry (BMPs).” Similar wording was also added to the Setting section of the Riparian Corridor prescription area.

**200. Public Concern: The Forest Service should specify that early successional habitat may be created in intermittent or ephemeral streams and perpendicular to streams for woodcock habitat.**

**Response:** Direction as written in the Revised Forest Plan allows for this condition or conditions very much like it. We anticipate additional areas of early seral habitat to be created just outside the Riparian Corridor through management action and areas with some early seral habitat components to be created within the Riparian Corridor through storm events.

**201. Public Concern: The Forest Service should not classify riparian acreage as unsuitable for timber production and should maintain a range of habitat management activities within riparian areas.**

**Response:** Habitat management activities including timber harvesting activities may occur in riparian corridors when they are needed to maintain, restore or enhance riparian functions and values or to meet the needs of riparian associated species. Under 36 CFR 219.27(c)(1), harvesting activities can occur on lands classified as “not suited for timber production” when such activities are necessary to protect other multiple-use values or are needed to meet forest plan objectives. Riparian corridors were designated as not suitable for timber production because it was determined that managing these lands for the purposes of having “regulated crops of trees...for industrial or commercial use” (36 CFR 219.3) was inconsistent with meeting the desired conditions of the riparian corridor. Riparian associated species includes all native species found in the riparian area.

**202. Public Concern: The Forest Service should explain why riparian/aquatic habitat couldn’t be increased (DEIS 3-202).**

**Response:** The statement you refer to addresses only the amount of riparian area, not the quality of riparian areas. Forestwide Goal 3 and its objectives address enhancing the individual values and ecological functions of riparian areas.

**203. Public Concern: The Forest Service should specify that access development will be allowed within riparian corridors for management of Habitat Diversity or the Ruffed Grouse Emphasis Areas.**

**Response:** Roads are conditionally allowed in the Riparian Corridor prescription area. Please refer to 1.E-Objective-5.B of the Draft Revised Forest Plan.



**204. Public Concern: The Forest Service should prioritize riparian corridors and provide flexibility in implementing objectives.**

**Response:** The priority of specific actions will be determined annually as 10-year cycle site-specific inventories are completed. Actions will occur based upon annual budgets and resources available.

**205. Public Concern: The Forest Service should explain why riparian areas are singled out regarding effects of grassy openings on aquatic habitat in 1.E-WLF-2.**

**Response:** This standard is intended to help achieve the desired future condition of the riparian corridor.

**206. Public Concern: The Forest Service should prohibit any in-stream disturbance when proposed, endangered, threatened, or sensitive species occur nearby.**

**Response:** All activities will be evaluated at the project level and will comply with all National Environmental Policy Act and Endangered Species Act requirements.

**207. Public Concern: The Forest Service should establish strict guidelines for crossing ephemeral streams to harvest timber.**

**Response:** Standard DB-ENG-4 in the Revised Forest Plan states, “Restrict motorized vehicle use in the scoured ephemeral stream zone to designated sites.”

**208. Public Concern: The Forest Service should allow the use of designated equipment within riparian areas.**

**Response:** The following desired future conditions and standards have been added to the Riparian Corridor Prescription Area in an effort to clarify management direction:

- **DFC addition** - Vegetation management, including a limited amount of logging, may occur when the purpose is to improve riparian function and values or where cable corridors are needed for adjacent prescription areas.
- **1.E-VEG-1.** Cable logging corridors, cable sets, and tail trees may be installed in this Prescription Area only at designated locations. Full suspension will be required if logs are yarded across perennial or intermittent streams.
- **1.E-VEG-4.** Skid roads and skid trails used for management of adjacent Prescription Areas must not encroach upon the riparian corridor.

**209. Public Concern: The Forest Service should prohibit roads, trails, timber harvest, salvage operations and all similar activities within riparian corridors.**

**Response:** Protection is provided in the Revised Forest Plan for streams, lakes, aquatic resources, wetlands, and floodplains (see Riparian Prescription and Forestwide direction). Riparian Corridor widths were based on an assessment of aquatic resources conducted for the Daniel Boone National Forest in 2001, input from specialists in the Forest Service Southern Region, research findings, monitoring data, current literature recommendations, and Daniel Boone National Forest professional expertise. Further protection will be considered and prescribed as needed when projects are developed.

**210. Public Concern: The Forest Service should modify 1.E. goals, objectives, and standards for riparian areas and corridors, as recommended.**

**Response:** All the suggested changes were considered and many of the specific changes suggested were made in the Revised Forest Plan.

## Biological Elements

**211. Public Concern: The Forest Service should maintain the viability of native species, protect federally listed species, and enhance habitats.**

**Response:** We believe the Revised Forest Plan will do this. Refer to the analysis of species viability in Chapter 3 of the FEIS.

**212. Public Concern: The Forest Service should provide standards for additional species beyond Indiana bats.**

**Response:** Standards specific to Indiana bat were developed because of its likely ubiquitous presence on the Daniel Boone National Forest, and its nature of use of the forest. Other species across the spectrum are addressed through specific standards (e.g., peregrine aeries, 1.C.WLF-3; PETS, 1.C.WLF-1; cliff species, 1.C.REC-3), habitat objectives (e.g., cerulean warbler, Objective 1.1.B.; various habitat conditions, 1.K.Objective 1.A - 1.M) and the establishment of prescription areas circumscribing particular types of habitats (e.g., Cliffline Prescription Area, Rare Communities Prescription Area, Significant Bat Cave Prescription Area). These prescription areas were developed, in part, based on information in the Viability Assessment completed in 2003. The needs of other species are covered through these measures. As needed, monitoring is available as a tool.

**213. Public Concern: The Forest Service should conduct detailed biological inventories.**

**Response:** Inventories are conducted as stand-alone projects and as part of other projects.

**214. Public Concern: The Forest Service should specify details for aquatic species, rare species, and allowing woody material to enter the aquatic environment for habitat.**

**Response:** We believe prescription area and Forestwide management direction provides for these species, and in fact was developed with the full range of species in mind.

**215. Public Concern: The Forest Service should explain differences in requirements for scientific specimen removal permits across prescriptions.**

**Response:** Changes have been made to prescription area descriptions to add consistency where needed.

**216. Public Concern: The Forest Service should establish strong, binding standards and monitoring requirements.**

**Response:** We believe the management direction developed for the Revised Forest Plan provides for appropriate management, including protection of species, their habitats, and other forest resources.

## BIODIVERSITY

**217. Public Concern: The Forest Service should keep the focus on biodiversity within the forest.**

**Response:** Biodiversity considerations were reflected in several of the 14 significant issues that guided development of the alternatives considered. The Revised Forest Plan provides management direction that will enhance the biodiversity on the Daniel Boone National Forest.

**218. Public Concern: The Forest Service should take a hard look at the biological diversity of the Daniel Boone National Forest. The Forest Service should clearly define “management for biodiversity,” and address conflicts between biodiversity and timber management goals. The Forest Service should strive to achieve native biodiversity without commercial timber harvest.**

**Response:** We have compiled a list of around 4,000 species that are known to occur or are reasonably expected to occur on the National Forest. We will continue to develop that list as time goes on. The Revised Forest Plan was developed to provide for the various aspects of biodiversity (see definition for biological diversity in the Revised Forest Plan or FEIS glossary) and uses a variety of tools and techniques, including the cutting and harvest of trees, to achieve biodiversity goals. The Revised Forest Plan shifts the role of timber harvesting from one of primarily an activity to produce timber, to one as a tool for creating the desirable future conditions described in the Plan and yielding timber as a byproduct.

**219. Public Concern: The Forest Service should protect habitat. The Forest Service should maximize biodiversity and restore the traditional native plant ecology. The Forest Service should specify that genetic variability for forest species will be maintained. The Forest Service should also implement management activities that sustain a high diversity of habitat and species.**

**Response:** We believe that the mix of prescriptions and their respective goals, objectives and standards -- along with Forestwide goals, objectives and standards -- will do this.

## **PROPOSED, ENDANGERED, THREATENED, SENSITIVE, AND RARE SPECIES**

**220. Public Concern: The Forest Service should include all animals and plant life currently on the Forest on the list of protected and monitored species.**

**Response:** The National Forest Management Act requires that species viability be maintained on national forests. What the comment suggests is integral within Goal 1 of the Plan. For more information, see the Viability section in Chapter 3 of the FEIS and Appendix D of the Revised Forest Plan.

**221. Public Concern: The Forest Service should protect endangered species.**

**Response:** Consultation with the U.S. Fish and Wildlife Service is required for all federal actions on the forest, including programmatic actions such as the Revised Forest Plan. The National Forest Management Act (NFMA) requires that species viability be maintained on the national forest. Adherence to these federal laws is mandatory and the Revised Forest Plan provides management direction that supports compliance with NFMA and the Endangered Species Act.

**222. Public Concern: The Forest Service should rebuild endangered populations.**

**Response:** The desired future conditions of the prescriptions areas describe the conditions that are favorable to increasing the population levels of proposed, endangered, threatened, and sensitive species on the Daniel Boone National Forest. Goals and objectives are designed to move the National Forest toward these habitat conditions. Specifically, the Revised Forest Plan establishes a goal (1.C-Goal 2) to facilitate the delisting of white-haired goldenrod during this planning period. As recovery plans are written and re-written, they will be used in conjunction with desired future condition.

**223. Public Concern: The Forest Service should demonstrate that it has fully and accurately used the best available science in identifying and ranking species with viability concerns, including extirpated species.**

**Response:** While it may appear that we have ignored some listed or extirpated species, we have not. The viability analysis process we used was based in part on the presence of, or a high likelihood of the presence of, a given species within the planning unit (National Forest System land). If the species is extirpated and or the habitat is gone, it was assigned an F Rank of FH, FX or F0 and considered no further. New information may prompt a revision of the analysis for the species.

**224. Public Concern: The Forest Service should use surveys conducted by the Forest Service, Kentucky State Nature Preserves Commission, and the Nature Conservancy for designating unique prescription areas and rare communities.**

**Response:** Information from cooperative efforts was used to develop and consider both old-growth and rare communities. However, it was not the only consideration. Our approach to both differed from that of Kentucky State Nature Preserves Commission and The Nature Conservancy, and the gross level mapping did not allow us in every case to specifically identify rare communities. We expect more sites to be added with additional fieldwork.

**225. Public Concern: The Forest Service should implement a Forest Conservation List to track occurrences and trends, and use assessments of viability to direct management activities uniformly across ranger districts.**

**Response:** We have a list in place that appears in part in Appendix H of the FEIS (It does not include species ranked FX, FH or F0). We expect this list to change regularly and frequently and, therefore, do not believe it appropriate to include it as a static list in the Revised Forest Plan.

**226. Public Concern: The Forest Service should conduct species assessments, establish population levels necessary for viability, and ensure viability. The Forest Service should develop specific objectives and standards for rare and sensitive species, conduct annual monitoring, and evaluate mitigation measures. The Forest Service should analyze the effects of each alternative on the survivability of each species and critical habitat.**

**Response:** The process outlined in the Viability section of Chapter 3 and Appendix H of the FEIS addresses the vast number of species present, the lack of appropriate data to do species assessments with population levels, and an appropriate focus on habitat supported by regulation. In addition, Chapter 5 of the Revised Forest Plan includes monitoring of habitat and population elements to gauge the effects of Forest Plan implementation on species and ecosystems.

**227. Public Concern: The Forest Service should implement directives and plans for species' reintroduction and recovery and specify management measures.**

**Response:** Specific management measures used in the reintroduction and recovery of species populations are an evolving science and depend, in part, upon project-specific analysis. The Revised Forest Plan addresses the need for species recovery in Goal 1.1. More specific direction or plans will be addressed during project planning.

**228. Public Concern: The Forest Service should comply with direction requiring management and recovery of threatened, endangered, and sensitive species.**

**Response:** We agree. The Revised Forest Plan does not supercede any federal law or manual direction.

**229. Public Concern: The Forest Service should conduct analysis to determine if federally listed species inhabit old mines and whether activities around the mines could affect the species.**

**Response:** This is a site-specific project rather than something to be specifically delineated in a forest plan. The Daniel Boone National Forest is currently evaluating several old mine openings to determine their use by proposed, endangered, threatened, and sensitive bats.

**230. Public Concern: The Forest Service should evaluate habitats to determine their capability to support re-introduction of proposed, endangered, threatened, and sensitive species.**

**Response:** Goal 1.1 states: “Evaluate habitats to determine those capable of supporting re-introduction of proposed, endangered, threatened, and sensitive species.” As opportunities arise, specific habitat and species evaluations can occur to address this Forestwide goal.

**231. Public Concern: The Forest Service should manage marginal habitats and populations.**

**Response:** Marginal or unsubstantiated habitats for many species, including bats, are provided for in several of the designated prescription areas. For example, hundreds if not thousands of caves exist within the Cliffline Community prescription area and are subject to programmatic habitat protections associated with that area. If inventory or monitoring data indicates these individual sites are in need of additional protective measures, they can be applied on an individual, site-specific basis.

**232. Public Concern: The Forest Service should require collectors to report data for monitoring purposes.**

**Response:** This is a specification for commercial and scientific permits. Personal use permits are not subject to this specification.

**233. Public Concern: The Forest Service should define and provide full details on ‘keystone’ species.**

**Response:** Keystone species is defined in the FEIS. We considered keystone species in our analysis. Those which do not fit “declining species of high public interest” or listed species or species with limited populations (see FEIS), are not considered further as explained in the FEIS.

**234. Public Concern: The Forest Service should provide details regarding the use of enforcement to prevent negative effects of activities to endangered species.**

**Response:** The Revised Forest Plan creates prescription areas, including Significant Bat Cave, Riparian Corridor, and Cliffline Community, with management direction and specific standards designed to provide programmatic protection for species associated with these areas. Other Forestwide standards, objectives, and desired future conditions are designed to maintain species viability across the National Forest. Law enforcement actions are not part of the decisions made in a forest plan.

**235. Public Concern: The Forest Service should analyze the effects of management for game species on the viability of proposed, endangered, threatened, and sensitive species.**

**Response:** The Kentucky Department of Fish and Wildlife Resources (KDFWR) manages populations of game species throughout the state, including the Daniel Boone National Forest. The Forest Service manages habitat for game species on National Forest System land. Except for ruffed grouse, proposed management on the Daniel Boone National Forest does not specifically target any game species, although we acknowledge that several are likely to benefit from such management. Analysis conducted in the Daniel Boone National Forest Management Indicator Species Report of 2001 suggests that white-tailed deer populations are increasing without regard to habitat management on the Forest. As needed, we have the opportunity to exclude deer and or other species from certain habitats and work with KDFWR to modify population levels.

**236. Public Concern: The Forest Service should specify more research needs for proposed, endangered, threatened, and sensitive species.**

**Response:** Research is recognized as an important component of species and habitat management on a national basis, especially for federally listed species. While research on the Daniel Boone National Forest is encouraged, specific research projects are not part of the actions approved by a forest plan.

**237. Public Concern: The Forest Service should list native communities in Goal 1.1 that will be restored to support proposed, endangered, threatened, and sensitive species, and provide consistent coverage.**

**Response:** This information is provided in the Proposed, Endangered, Threatened and Sensitive Species section in Chapter 3 of the FEIS.

**238. Public Concern: The Forest Service should specify how buffer zones around natural areas and significant watersheds will be managed to protect imperiled species.**

**Response:** Site-specific analysis occurs for projects to implement the Revised Forest Plan. Protection will be applied as analysis shows it is needed.

**239. Public Concern: The Forest Service should ensure accuracy regarding rare birds and habitat management.**

**Response:** For Kentucky, and most of its range, the comment is correct. The error has been corrected in the Revised Forest Plan and FEIS. What is important is that the correct habitat association is in place where it might have affected analysis.

**MANAGEMENT INDICATOR SPECIES (MIS)**

**240. Public Concern:** The Forest Service should expand species designated as management indicator species. Reptiles, amphibians, mussels, fish, cave species, aquatic macro-invertebrates, and rare species should be monitored. The Forest Service should explain why cowbirds are excluded from the management indicator species list. Other flora should be used as management indicator species instead of pitch pine. White-tailed deer should not be used as a management indicator species. The Forest Service should specify management and monitoring requirements and work with partners to implement programs. The Forest Service should use teams of conservation biologists when selecting species for monitoring and management. Management and species responses should be documented. The Forest Service should conduct full surveys and inventories of species and their habitats sufficient to ensure species viability. The Forest Service should use a robust management indicator species program and not rely on plan-level analysis of community habitat types.

**Response:** These concerns have been addressed in a new section within the FEIS (Appendix B, MIS), and in the Revised Forest Plan (Appendix D, Monitoring).

**241. Public Concern:** The Forest Service should provide the same regulatory importance to the Macroinvertebrate Index of Biological Integrity (MIBI) as Management Indicator Species.

**Response:** The MIBI, selected to represent aquatic communities, do not meet the definition given to MIS in the implementing regulations for the National Forest Management Act, but we have identified them as an equally important monitoring element (Revised Forest Plan, Chapter 5).

**242. Public Concern:** The Forest Service should specify 2-3 species with intolerance for silt/sediment as management indicator species.

**Response:** Several fish species will be regularly monitored (especially the proposed, endangered, threatened, and sensitive species) at the project level. This will be done in addition to monitoring of indices based on macroinvertebrate assemblages.

**243. Public Concern:** The Forest Service should acknowledge and include the 1996 Citizens' Alternative list of management indicator species.

**Response:** We were able to find a list of 3 species, all birds, two of which were included in our MIS list. The third we considered but did not believe it met the conditions for an effective MIS species on the Daniel Boone National Forest.

**244. Public Concern:** The Forest Service should establish a range of management indicator species that vary by alternative and management activity.

**Response:** Please see the MIS section in Appendix B of the FEIS. Varying MIS by alternative prevents comparison of effects by alternative.

**245. Public Concern:** The Forest Service should include aquatic species as management indicator species, conduct monitoring at least every five years, and conduct monitoring every 2-3 years if federally listed aquatic species are present, or when potential projects are planned.

**Response:** Aquatic macroinvertebrate assemblage indices will be monitored (Chapter 5, Revised Forest Plan) to evaluate the effects of management on aquatic communities. More frequent monitoring (more than every ten years) will be accomplished at the project level, but will be done on an irregular schedule.

**246. Public Concern: The Forest Service should explain how aquatic management indicator species are unrelated to riparian disturbances.**

**Response:** The Watershed Health Index is a relatively large-scale coarse filter developed to evaluate alternatives in forest plans and to establish priority work at the planning scale. Therefore, further detailed analyses of the watershed will be conducted at the project level.

**247. Public Concern: The Forest Service should specifically list and address proposed, endangered, threatened, and sensitive species as an objective in Goal 1.1.**

**Response:** The current list of proposed, endangered, threatened, and sensitive species is provided within the supporting DEIS and the Biological Assessment prepared for the Revised Forest Plan. The Biological Assessment is part of the process records and is available for inspection upon request.

**248. Public Concern: The Forest Service should remove dates from J.E-WLF-1 for proposed, endangered, threatened and sensitive species.**

**Response:** These dates are designed to provide programmatic direction during the period believed to be most sensitive to aquatic species, particularly mussel populations. Site-specific project analysis will determine whether further limitations on management actions are warranted.

**249. Public Concern: The Forest Service should analyze the effects of each alternative on the viability of management indicator species.**

**Response:** We provided analysis for the effects of each alternative on MIS. Please see the MIS discussion under the Vegetation Cover section in Chapter 3 of the FEIS.

## LOCALLY RARE SPECIES

**250. Public Concern: The Forest Service should protect locally rare species and ensure viability.**

**Response:** The National Forest Management Act requires that species viability be maintained on national forests. What the comment suggests is integral within Goal 1 of the Plan. For more information, see the FEIS (Chapter 3 Viability and Appendix H).

**251. Public Concern: The Forest Service should protect and restore rare species habitat.**

**Response:** We believe the Revised Forest Plan as designed gives this direction.

**252. Public Concern: The Forest Service should address sensitive and locally rare species issues through habitat development and protection.**

**Response:** The Revised Forest Plan has been developed to provide objectives for the enhancement of rare species habitat and standards to limit actions that could cause undesirable effects to this habitat.



**253. Public Concern: The Forest Service should ensure that lists of sensitive and locally rare species are developed in an objective manner based on science, and not use lists to elevate concern above what is reasonable and pertinent.**

**Response:** Both lists were objectively developed using the best available science. The sensitive list is derived from the Regional Forester's Sensitive list (see FEIS, Chapter 3, Proposed and Endangered, Threatened, and Sensitive Species), whereas the locally rare list was developed through a regional partnership with NatureServe (see discussion in the Viability section of Chapter 3 and Appendix H of the FEIS).

## SPECIFIC SPECIES

**254. Public Concern: The Forest Service should protect bat caves.**

**Response:** We agree and this is an important provision of the Revised Forest Plan. Refer to the Significant Bat Cave prescription area in the Revised Forest Plan.

**255. Public Concern: The Forest Service should implement the Significant Bat Caves Prescription Area.**

**Response:** This prescription area is in the Revised Forest Plan.

**256. Public Concern: The Forest Service should expand bat maternity habitat.**

**Response:** A Forestwide standard currently protects habitat within 2½ miles of maternity sites during the summer months. If site-specific analysis determines that a larger area is needed to include adequate water needs, additional distances from the maternity site can be applied. The development of water sources is concentrated in the vicinity of where the bats are known to occur.

**257. Public Concern: The Forest Service should implement Prescription Area 1.J, but with larger buffer areas deemed unsuitable for timber production.**

**Response:** The actual prescription area covers an area of ¼ mile radius from significant bat caves. However, additional standards limit management activity, including timber harvest, both seasonally and within the area of the bat cave to provide habitat protection.

**258. Public Concern: The Forest Service should revise and expand the definition of "significant bat cave."**

**Response:** We agree that all caves are special habitats. All caves on the Daniel Boone National Forest receive programmatic protection through Forestwide standards and the Cliffline Community and Significant Bat Caves prescription areas. In addition, any project is subject to site-specific analysis to determine, in part, if additional protective measures are needed for cave resources.

**259. Public Concern: The Forest Service should conduct research on bat foraging as related to management actions on canopies.**

**Response:** Specific research projects are not part of what forest plans decide. We certainly recognize the need for this type of research and encourage its undertaking.

**260. Public Concern: The Forest Service should use the latest scientific information to protect bats and consider recent court rulings.**

**Response:** We believe that through working with the U.S. Fish and Wildlife Service, we have included in the Revised Forest Plan the best science available in the management of all proposed, endangered, threatened, and sensitive species on the Daniel Boone National Forest.

**261. Public Concern: The Forest Service should specify measures to protect the Indiana bat.**

**Response:** Numerous protections for the Indiana bat and its habitat are found throughout the Revised Forest Plan, as well as objectives that should aid in its recovery. Both prescription area and Forestwide standards have been designed to protect the Indiana bat and its habitat.

**262. Public Concern: The Forest Service should not single out Indiana bats for species-specific objectives.**

**Response:** The Daniel Boone National Forest is required by law and policy to protect all proposed, endangered, threatened, and sensitive species occurring on the forest. Much of the Indiana bat management direction was developed from earlier U.S. Fish and Wildlife Service Biological Opinions written specifically for the Indiana bat on the Daniel Boone National Forest.

**263. Public Concern: The Forest Service should revise management activities and viability analysis for mussels to reflect current research.**

**Response:** The Watershed Health Index (WHI) and associated analyses were designed to identify large-scale attributes that may contribute to the maintenance of aquatic systems. Changes in land use and disturbance were modeled with respect to estimated increases in sediment and predicted impacts on available aquatic habitat. Surveys and monitoring of mussel populations and distributions are ongoing on the Daniel Boone National Forest.

**264. Public Concern: The Forest Service should not use the cerulean warbler as a management indicator species because the specificity makes this a site-specific consideration, not a forest plan consideration.**

**Response:** Management Indicator Species are to be considered in site-specific projects. Specific management direction for cerulean warbler was developed because of the large area considerations needed. More local site-specific decisions will determine exactly where to apply management for the desired conditions associated with this species and others with similar requirements.

**265. Public Concern: The Forest Service should specify desired future conditions and goals for the red-cockaded woodpecker.**

**Response:** Restoration of the pine community upon which the red-cockaded woodpecker (RCW) depends is a long-term goal of the Revised Forest Plan. Because of the devastating southern pine beetle infestation between 1999 and 2001, the Daniel Boone National Forest will continue to have no suitable habitat for the RCW during the next decade. In the future, as Revised Forest Plan directed activities continue, the RCW may once again be part of the biotic community on the National Forest. Whether this potential habitat will be needed to help in the recovery of the species is not a forest plan decision.

**266. Public Concern: The Forest Service should not single out the white-haired goldenrod for management focus.**

**Response:** This species is known to occur only on the Daniel Boone National Forest and therefore the ability to recover this species depends entirely on our management. Therefore, it is quite appropriate that we give it special attention.

## **RARE COMMUNITIES**

**267. Public Concern: The Forest Service should protect rare communities and habitat.**

**Response:** We agree. Please see the Rare Community section in both the Revised Forest Plan and FEIS.

**268. Public Concern: The Forest Service should provide greater detail and expand communities listed in Prescription 1.G to incorporate data and priorities submitted by the Nature Conservancy and Kentucky State Nature Preserves Commission. The Forest Service should specify protections for rare communities and designate larger protective areas around rare communities.**

**Response:** We used information provided by TNC and KSNPC, as well information from other sources, to develop the Rare Community prescription. We developed a prescription area (management zone) for rare communities and included direction in the Revised Forest Plan that will allow us to achieve the desired future condition. In some instances we differ on what constitutes a rare community and how to define them.

**269. Public Concern: The Forest Service should prevent over-visitation in rare communities.**

**Response:** In the Revised Forest Plan, 1.G-Objective-1.D and standards 1.G.Rec-2 and 1.G.Rec-3 address this concern.

**270. Public Concern: The Forest Service should prohibit concentrated public use within rare community zones to include the entire watershed.**

**Response:** This concern is addressed site-specifically, as needed.

**271. Public Concern: The Forest Service should specify standards for rare aquatic communities.**

**Response:** The Riparian Corridor prescription area encompasses all aquatic communities. The designation of aquatic macroinvertebrate assemblage indices as a monitoring need will ensure monitoring of these important communities.

**272. Public Concern: The Forest Service should modify standards regarding rare communities, as recommended.**

**Response:** After reviewing the recommendations we have determined that the standards are adequate as stated in the Proposed Revised Forest Plan.

**273. Public Concern: The Forest Service should not attempt to maintain rare communities in stable conditions.**

**Response:** We have added some clarification in the Setting description for the Rare Communities prescription area of the Revised Forest Plan and in the Rare Communities section in Chapter 3 of the FEIS.

**274. Public Concern: The Forest Service should clarify whether warm season grasses/forbs fit within the rare community prescription.**

**Response:** They are included within the prescription area. Please see the Setting description under Native Warm-season Grassland in the Rare Communities prescription area of the Revised Forest Plan.

**275. Public Concern: The Forest Service should specify bottomland hardwood wetlands as a rare community.**

**Response:** We have identified swamps as rare communities and would expect that *hardwood wetlands* are included in this community.

**276. Public Concern: The Forest Service should mention all rare community types in 1.G-Obj-1.E, or none.**

**Response:** We did not include all seeps in the Rare Community prescription area, only those with federally listed, Forest Service Sensitive or Daniel Boone National Forest Conservation species in them.

**277. Public Concern: The Forest Service should apply “restore or reestablish” in 1.G-Obj-1.F to all communities.**

**Response:** We have clarified this objective in the Revised Forest Plan to apply to all rare communities.

**278. Public Concern: The Forest Service should expand rare community management zones beyond wetlands.**

**Response:** We disagree. We believe that direction provided in the Revised Forest Plan will allow us to manage these rare communities appropriately, as defined.

**279. Public Concern: The Forest Service should group rare communities that have similar hydrological regimes.**

**Response:** We chose to separate them so that the specific needs each community would be addressed individually.

**280. Public Concern: The Forest Service should prohibit the placing of an impoundment in any rare community, not just canebrakes.**

**Response:** Canebrakes are specifically mentioned because of their usual topographic position on the landscape. Any proposal to create an impoundment will take into consideration other rare community concerns on a site-specific basis.

## ECOSYSTEM/HABITAT COMPOSITION AND FUNCTION

**281. Public Concern: The Forest Service should identify habitat types that need buffering and broad scale ecosystem management as well as develop measures of success.**

**Response:** The habitat objectives have been designed to be large enough to not require “buffering.” Please see Chapter 3 of the Revised Forest Plan.

**282. Public Concern: The Forest Service should develop and implement habitat restoration for habitats used by migratory birds.**

**Response:** Goal 1 and its subgoals, and several of the prescription areas in the Revised Forest Plan provide a range of habitat conditions for these species.

**283. Public Concern: The Forest Service should develop desired future conditions specifying that habitat will be provided for game species as well as for threatened and endangered species.**

**Response:** Planning regulations in the National Forest Management Act require us to provide for diversity across the landscape. Our analysis indicates that our mix of prescription areas allows for a diversity of habitat for all species. Please see Goal 11 of the Revised Forest Plan and the various prescription areas. See also the Demand Species section in Chapter 3 of the FEIS.

**284. Public Concern: The Forest Service should provide adequate habitat for game birds and songbirds.**

**Response:** Goal 1 and its subgoals, and several of the prescription areas in the Revised Forest Plan provide a range of habitat conditions for these species.

**285. Public Concern: The Forest Service should include insect and disease habitat components, and pit and mound habitat components.**

**Response:** Insects and disease will occur on the landscape regardless of whether we specifically provide for them. We will respond to such outbreaks on a site-specific basis. Pit and mound habitat will be provided for by wind events across the National Forest.

**286. Public Concern: The Forest Service should relocate all activities that disturb the ecology or habitats of forest communities.**

**Response:** Proposed activities are designed to create habitats within forest communities. Some habitats require disturbance to restore or maintain them. The effects of our management activities are analyzed on a site-specific basis.

**287. Public Concern: The Forest Service should manage the Daniel Boone National Forest as large blocks of intact forest, and not create diverse habitats for biodiversity.**

**Response:** Planning regulations for the National Forest Management Act require us to provide for diversity across the landscape. Our mix of prescription areas allows for both large blocks and a diversity of other habitat.

**288. Public Concern: The Forest Service should not create open habitats, but instead, implement cooperative agreements with private landowners.**

**Response:** We recognize that it is not necessary for the Daniel Boone National Forest to provide large blocks of 100 or more acres of open habitat across the landscape. However, many species on the National Forest benefit from small (1/4 to 10 acre) openings and for these we have included open habitat objectives.

**289. Public Concern: The Forest Service should implement the Habitat Diversity Emphasis prescription.**

**Response:** The Revised Forest Plan includes this prescription area.

**290. Public Concern: The Forest Service should clarify numbers of acres reported for the Habitat Diversity Emphasis Area, community descriptions, and habitat components to correct discrepancies.**

**Response:** Numbers used in the Habitat Diversity Emphasis prescription for various habitats do not necessarily translate directly to numbers in, for example, the Vegetation cover section of the FEIS. They are designed for different purposes. The objectives for acres within the Habitat Diversity Emphasis prescription area have been clarified in the Revised Forest Plan. Forestwide standards also apply to the Habitat Diversity Emphasis prescription area.

**291. Public Concern: The Forest Service should specify an objective to manage the Habitat Diversity Emphasis Area that will provide permanent forest openings of diverse, natural herbaceous vegetation and trees.**

**Response:** Goal 1.5 of the Revised Forest Plan emphasizes native grasses and their associated forbs. We agree that trees and shrubs are appropriate components in many cases. The need for inclusion of these components will be determined site specifically at the project level.

**292. Public Concern: The Forest Service should specify that desired habitat condition is the primary purpose for the Habitat Diversity designation, define habitat diversity, and specify how goals will be prioritized and conflicts resolved.**

**Response:** What the commenter suggests is specified and explained in the Desired Future Condition section of the Habitat Diversity Emphasis prescription area (Chapter 3, Revised Forest Plan). Habitat diversity is defined in the glossary. Goals have not been prioritized, since all are important in the management of the National Forest. Any conflicts will be resolved during project planning and decision making.

**293. Public Concern: The Forest Service should clarify, modify, and specify additional goals and objectives within the Habitat Diversity Prescription Area.**

**Response:** Direction in the Habitat Diversity prescription area of the Revised Forest Plan is appropriate for achieving the desired future condition.

**294. Public Concern: Early successional woodland habitat should be permitted in riparian areas.**

**Response:** The Riparian prescription area management direction allows for the development of shrub openings and open canopy/shrub areas.

**295. Public Concern: The Forest Service should specify more standards within the Habitat Diversity Prescription Area.**

**Response:** The Forestwide direction presented in Chapter 2 of the Revised Forest Plan, as well as the Desired Future Condition, Goals, and Objectives in the Habitat Diversity Prescription, provide adequate direction for this area.

**296. Public Concern: The Forest Service should provide a scientific rationale and data for each Habitat Diversity Prescription Area objective, and conduct independent peer review of habitat designation.**

**Response:** We believe we have developed a mix of habitats consistent with planning regulations, the need to provide habitat for species on the National Forest, and the indications of past conditions in the area. In addition, endangered species and migratory bird personnel of the U.S. Fish and Wildlife Service have reviewed the Revised Forest Plan's management direction. Please see the Viability section in Chapter 3 of the FEIS.

**297. Public Concern: The Forest Service should not implement the Habitat Diversity Prescription Area because of a lack of scientific basis for conditions such as woodlands and grasslands.**

**Response:** There is scientific evidence that indicates a need for such habitat (see FEIS, Chapter 3, Viability). However, we are taking a conservative approach and plan on monitoring the results of this new management direction. The Revised Forest Plan can be amended if monitoring discloses such a need.

**298. Public Concern: The Forest Service should establish openings other than those created through forest regeneration.**

**Response:** Goal 1.5 of the Revised Forest Plan addresses the need for grassland habitat.

**299. Public Concern: The Forest Service should not conduct grapevine control in the Ruffed Grouse Emphasis Prescription Area.**

**Response:** Grapevine control may be considered on a site-specific basis taking into account the overall condition of grouse habitat.

**300. Public Concern: The Forest Service should maximize soft mast production.**

**Response:** Specific habitat conditions such as soft mast production will be considered site specifically during project planning and decision making.

**301. Public Concern: The Forest Service should demonstrate scientific evidence of the historical presence and distribution of habitat before arbitrarily creating new habitat.**

**Response:** We believe we have developed a mix of habitats consistent with planning regulations, the need to provide habitat for species on the National Forest, and the indications of past conditions in the area we have. Please see the Viability section in Chapter 3 of the FEIS.

**302. Public Concern: The Forest Service should implement Goal 1.3 and Objective 1.3.A to acquire high elevation forest habitat.**

**Response:** We agree. We have made a correction in elevations in Objective 1.3.A in the Revised Forest Plan based on potentially available land within the proclamation boundary.

**303. Public Concern: The Forest Service should protect large dead/dying trees.**

**Response:** Please see the Old-growth sections in Chapter 3 of the Revised Forest Plan and Chapter 3 of the FEIS. Additional standards and objectives have been included in the Habitat Diversity Emphasis prescription area to address management of snags.

**304. Public Concern: The Forest Service should clarify text for snags and roost trees.**

**Response:** We have made changes in Chapters 2 and 3 of the Revised Forest Plan for clarification.

**305. Public Concern: The Forest Service should modify DB-WLF-2 regarding the tracking of snags.**

**Response:** This standard has been modified. Please see Chapter 2 of the Revised Forest Plan.

**306. Public Concern: The Forest Service should specify that all objectives under Goal 1.E.2.A. seek to provide habitat for flora and fauna within riparian areas.**

**Response:** We have made a change to 1.E-Goal 2. in the Revised Forest Plan to clarify this point.

**307. Public Concern: The Forest Service should change the desired future condition for the Habitat Diversity Emphasis Prescription Area so it will support mature or climax forest communities.**

**Response:** The desired future condition for the Habitat Diversity Emphasis prescription area includes components for mature forest communities. See Chapter 3 of the Revised Forest Plan.

## **FRAGMENTATION AND EDGE EFFECTS**

**308. Public Concern: The Forest Service should prevent forest fragmentation and habitat loss and disturbance. The Forest Service should analyze the effects and cumulative effects of all fragmentation. The Forest Service should prevent fragmentation by establishing a “core area” that is protected, with timber harvest activities allocated to the periphery.**

**Response:** We examined the fragmentation issue in Chapter 3 of the FEIS. Non-forest land uses that fragment the forest landscape are mostly the result of urbanization. This concern will be addressed through land acquisition and cooperative planning with local and state governments. (See Forestwide standard DB-LAND-2 in the Revised Forest Plan) Management activities that could contribute to within-forest fragmentation should have little effect on the broader scale landscape (see Table 3 - 70 in the DEIS). Consequently, core areas were deemed unnecessary to maintain suitable interior forest conditions.

**309. Public Concern: The Forest Service should modify text to remove loopholes that allow fragmentation.**

**Response:** Within-forest habitat fragmentation is somewhat inversely related to biological diversity. The mix of habitats across the National Forest is planned to sustain the diverse assemblage of forest species found on the Daniel Boone National Forest. This includes provisions for species that may be experiencing negative effects from fragmentation elsewhere throughout their range.

**310. Public Concern: The Forest Service should not create forest openings and early successional habitat.**

**Response:** The Revised Forest Plan focuses on providing habitat diversity to sustain the wide variety of plant and animals found on the Daniel Boone National Forest. Timber harvest is a tool that may be used where it is most efficient in developing and sustaining habitat, as projected in the desired future conditions for each prescription area. Although forest edge may reduce habitat suitability for interior species, it adds habitat diversity. Edge created by developing and maintaining early-age forest habitat (0-10 year age class) should not limit opportunities to sustain interior dependant species.

## **WILDLIFE (GENERAL)**

**311. Public Concern: The Forest Service should protect wildlife from harm and disturbance.**

**Response:** Provisions for the welfare of wildlife were analyzed in the DEIS, which resulted in appropriate protective and enhancement measures included throughout the Revised Forest Plan.



**312. Public Concern: The Forest Service should modify Goal 11 to specify that wildlife will be managed for healthy, balanced, stable populations, instead of for recreational opportunities.**

**Response:** The Revised Forest Plan focuses on providing habitat diversity to sustain the wide variety of plants and animals found on the National Forest. The plan also emphasizes the maintenance and restoration of ecological processes and functions while providing for multiple public benefits with added emphasis on recreation.

**313. Public Concern: The Forest Service should consider wildlife factors, as recommended, in the Lick Creek Area.**

**Response:** The Revised Forest Plan has neither a management area nor a prescription area called the “Lick Creek Area.” Consequently, since there are many Lick Creeks on the Daniel Boone National Forest, we’re not sure to what area the commenter was referring. This seems to be a site-specific concern. Nonetheless, the Revised Forest Plan focuses on providing habitat diversity to sustain the wide variety of plant and animals found on the National Forest.

**314. Public Concern: The Forest Service should conduct viability analysis on black bear and elk. The Forest Service should conduct analysis on the habitat needs of black bear, disclose current population numbers, and provide remote forest habitat. The Forest Service should specify management objectives for elk.**

**Response:** The black bear was not considered as a management indicator species because recent research indicates their response to managements actions differ according to maturity and sex. The level of monitoring required to differentiate between age, sex, and management actions is beyond our means. The North American elk was not considered as a management indicator species because of its recent arrival (via re-introduction) in Kentucky and its limited distribution on the Daniel Boone National Forest. The Kentucky Department of Fish and Wildlife Resources is currently funding research and monitoring projects to learn more about the lifestyle of elk in Kentucky. See the MIS section in Appendix B of the FEIS.

**315. Public Concern: The Forest Service should analyze the effects of management actions on demand species.**

**Response:** Please see Chapter 3 of the FEIS and the Viability Assessment For The Daniel Boone National Forest, July 2003. The Viability Assessment is part of the planning records and is available for inspection upon request.

**316. Public Concern: The Forest Service should analyze and disclose the rationale for goals and objectives for the management of beavers and dams.**

**Response:** The primary purpose for 1.E-Objective 2.B and 2.C is to provide needed habitat for the birds listed there, although beavers will also benefit from this habitat. The primary purpose for 1.E-Goal 7 is to address barriers to the movement of aquatic fauna; the barriers that are the subject of this goal are low water crossings, culverts, fords, and other similar structures.

## Ruffed Grouse

**317. Public Concern: The Forest Service should create more grouse habitat.**

**Response:** Suitable early-aged habitat will be created across the Daniel Boone National Forest through reforestation efforts, in addition to the Ruffed Grouse Emphasis prescription area. Harvest and regeneration during the first 10 years of the Revised Plan will produce about 25,000 acres in the 0-10 year age class, well distributed across the National Forest. Our analysis indicated that this will provide adequate habitat to sustain a huntable ruffed grouse population on the National Forest, as well as maintain an age structure needed to support other wildlife species dependant on early successional forest habitat.

**318. Public Concern: The Forest Service should designate land as Ruffed Grouse Emphasis Area in the Redbird Ranger District.**

**Response:** Making an addition to the Ruffed Grouse Emphasis prescription area on the Redbird Ranger District is covered in 3.H.1-Objective 1.D of the Revised Forest Plan. Further examination of the District is needed to identify the area best suited for this management emphasis.

**319. Public Concern: The Forest Service should create 5 to 20-acre stands for grouse habitat.**

**Response:** The harvest and regeneration stand size objective (3.H.1-Objective 1.B.) in the Ruffed Grouse Emphasis prescription area has been modified to reflect the recommendation.

**320. Public Concern: The Forest Service should not create additional grouse habitat.**

**Response:** The Ruffed Grouse Emphasis prescription area was developed to provide high-level population centers during naturally occurring low cyclic periods. These areas will sustain huntable ruffed grouse populations and add a prominent early-age forest element to the landscape diversity of the Daniel Boone National Forest. Species associated with early-age habitat will find near optimal conditions within these prescription areas, a condition not found elsewhere on the National Forest.

**321. Public Concern: The Forest Service should rename the Ruffed Grouse Emphasis Area as Early Successional Woodland Habitat Area.**

**Response:** Woodland is a term that describes a sparse forest condition and is not a planned component of these areas. Woodland is defined in the desired future condition of the Habitat Diversity Emphasis prescription area. The desired future condition provides for representative early-age associated forest species in this prescription area.

**322. Public Concern: The Forest Service should provide a better explanation of ruffed grouse habitat, young thickets, and early successional forest and the relationship of fire management to rare communities.**

**Response:** The application of prescribed fire within the ruffed grouse and early-age emphasis areas will be primarily within the mature upland forest component. Fire releases stored nutrients that stimulate new growth and increase soft mast production. It also favors the retention and maintenance of shade intolerant species such as oaks. Of course, climatic conditions at the time of burning and burn frequency are critical considerations in achieving specified objectives. The identification and management of rare communities are primary considerations in all prescription areas. Appropriate treatments will be applied to protect and ensure the continued persistence of identified rare communities.

**323. Public Concern: The Forest Service should require that grouse drumming logs be located within regeneration areas.**

**Response:** Standard 3.H.1-WLF-1 has been modified in the Revised Forest Plan to provide for ruffed grouse drumming logs.

**324. Public Concern: The Forest Service should collaborate with the Ruffed Grouse Society on habitat projects.**

**Response:** This is outside the scope of the Revised Forest Plan, but we look forward to cooperative opportunities to work with the Ruffed Grouse Society on individual projects and building a strong partnership in management of the ruffed grouse and other associated forest species.

**325. Public Concern: The Forest Service should explain how timber harvest and road building in grouse emphasis areas will maintain Semi-primitive Non-motorized and Semi-primitive Motorized recreational experiences.**

**Response:** Indeed, planned activities and management provisions will result in a roaded natural and roaded modified setting. Appropriate changes have been incorporated into standard 3.H.1-REC-1 in the Revised Forest Plan.

## Black Bear

**326. Public Concern: The Forest Service should preserve and manage habitat for black bear.**

**Response:** Habitat needs for black bear were considered in the Viability Assessment for the Daniel Boone National Forest, July 2003. This document is part of the planning record and is available for inspection upon request.

**327. Public Concern: The Forest Service should not portray the black bear as a nuisance.**

**Response:** The reference to “nuisance” bears has been removed from the Revised Forest Plan.

**328. Public Concern: The Forest Service should inform the public about interacting with bears and make refuse containers bear-proof.**

**Response:** We have addressed this concern through Objective 7.4.A and Goal 15 in the Revised Forest Plan.

**329. Public Concern: The Forest Service should place more importance on black bear and analyze the effects of management actions on black bear.**

**Response:** As a framework for decision-making, the Revised Forest Plan does not commit the Forest Service to any specific project or management action. Rather, it describes general management direction. Habitat disturbance factors for the black bear (and other species) are generally analyzed at the time a management action is proposed.

**330. Public Concern: The Forest Service should analyze the effects of poaching, other disturbance activities, and cut sites and escape cover on black bears.**

**Response:** Illegal activities are not permitted in any of the alternatives considered. Therefore, it is the same for all alternatives. As a framework for decision-making, the Revised Forest Plan does not commit the Forest Service to any specific project or management action. Rather, it describes general management direction. Habitat disturbance factors for the black bear (and other species) are generally analyzed at the time a management action is proposed.

**331. Public Concern: The Forest Service should analyze whether or when bear hunting will be permitted and the effects that hunting will have on bear populations.**

**Response:** The Kentucky Department of Fish and Wildlife Resources (KDFWR) is responsible for regulating hunting and fishing seasons; bag, creel, and possession limits; buying, selling, and transporting fish and wildlife; as well as methods and devices used to take fish or wildlife.

## Avifauna

**332. Public Concern: The Forest Service should conduct viability analysis on all bird species of conservation concern.**

**Response:** Bird species of conservation concern and reasonably expected to be found on the National Forest were included initially in the analysis. However, some were filtered out based on strong Daniel Boone National Forest populations. See the Viability section in Chapter 3 of the FEIS for more information.

**333. Public Concern: The Forest Service should protect birds of prey.**

**Response:** All birds of prey are protected under the Endangered Species Act. The management direction in the Revised Forest Plan facilitates compliance with the Act.

**334. Public Concern: The Forest Service should implement stronger avian monitoring, habitat restoration, objectives, and active management.**

**Response:** Please see Appendix B, MIS section of the FEIS, and Appendix D of the Revised Forest Plan for information related to monitoring priorities.

**335. Public Concern: The Forest Service should conduct annual bird monitoring.**

**Response:** We have been conducting such monitoring for a number of years and it is our intent to continue. Please see the monitoring task table in Appendix D of the Revised Forest Plan.

**336. Public Concern: The Forest Service should describe the role that the Daniel Boone National Forest plays for the cerulean warbler, a high priority species.**

**Response:** Please see Objective 1.1.B. in Chapter 2 of the Revised Forest Plan, and the Partners in Flight Landbirds section in Chapter 3 of the FEIS.

## AQUATIC WILDLIFE AND HABITAT

**337. Public Concern: The Forest Service should conduct realistic assessments of aquatic species viability and watershed health.**

**Response:** Our assessment model was developed to evaluate alternatives in forest plans and to establish priority work at the planning scale. The Watershed Health Index, however, does not necessarily indicate an excellent or poor watershed but broadly categorizes the watersheds based on the sediment prediction/aquatic viability relationship. Even in watersheds classified as excellent, Forest Service objectives are to maintain or improve aquatic health through the implementation of Forestwide standards and the Riparian Corridor prescription area. The organisms selected for the assessment were those that either currently or historically occurred on or near the Daniel Boone National Forest.

**338. Public Concern: The Forest Service should develop management strategies to protect and restore aquatic habitats rated as average or at-risk under the Watershed Health Index.**

**Response:** Forest Service objectives are to maintain or improve aquatic health through the implementation of Forestwide standards and the Riparian Corridor prescription area. In response to comments, however, the WHI has been modified, and cutoffs based on Forest Service ownership have been removed. All watersheds with Forest Service ownership will be addressed. This process has been renamed the *Watershed Condition Ranking* to reduce confusion.

**339. Public Concern: The Forest Service should designate watersheds that provide critical habitat for proposed, endangered, threatened, and sensitive species as Watershed Restoration Areas or Aquatic Habitat Areas.**

**Response:** Any proposed, endangered, threatened, and sensitive species found within a watershed will be specifically considered when activities are proposed. Based upon individual site characteristics, additional protections may be implemented.

**340. Public Concern: The Forest Service should protect aquatic habitats.**

**Response:** We agree. The Revised Forest Plan includes management direction intended to both protect and enhance aquatic habitats.

**341. Public Concern: The Forest Service should place equal emphasis on water quality and aquatic species as on riparian habitat.**

**Response:** The Revised Forest Plan is designed to avoid and minimize undesirable effects on aquatic resources through the Forestwide standards and the Riparian Corridor prescription area.

**342. Public Concern: The Forest Service should provide details on fish data and specify streams that support trout.**

**Response:** The figures used are currently accurate for the Daniel Boone National Forest. Some streams on the Daniel Boone National Forest that have been stocked in the past are no longer stocked, primarily because of adverse impacts to native species. The Kentucky Department of Fish and Wildlife Resources does stock other streams not on lands managed by the Daniel Boone National Forest.

## Fisheries (Sport)

**343. Public Concern: The Forest Service should specify protective measures for muskie and trout.**

**Response:** Muskie and trout are both considered “sport fish” by the Kentucky Department of Fish and Wildlife Resources (KDFWR). The Daniel Boone National Forest recognizes KDFWR as the responsible agency for regulating hunting and fishing seasons; bag, creel, and possession limits; buying, selling, and transporting fish and wildlife; as well as methods and devices used to take fish or wildlife

## CANEBRAKES

**344. Public Concern: The Forest Service should estimate the size of pre-European settlement canebrakes.**

**Response:** We agree. This task is to be attempted during the next 10-year planning cycle.

**345. Public Concern: The Forest Service should restore native canebrake communities in patches greater than 10 acres.**

**Response:** In the current 10-year planning cycle, we expect the 10-acre size to be our practical limit. We have the ability to site-specifically exceed 10 acres where there is the opportunity to do so and where such effort is likely to succeed.

## GRASSLANDS, SAVANNAHS, AND OPEN WOODLANDS

**346. Public Concern: The Forest Service should establish more native warm season grasses.**

**Response:** Goal 1.5 and its associated objectives in Chapter 2 of the Revised Forest Plan provide management direction for grassland habitat.

**347. Public Concern: The Forest Service should specify guidelines for the selection and adaptation of native components of planned natural areas and use of native/local genotypes.**

**Response:** These concerns are addressed at a site-specific project level.

**348. Public Concern: The Forest Service should maintain grassy openings along riparian zones and cliffhines as well as along roads and landings used in timber harvest.**

**Response:** Goal 1.5 and its associated objectives in the Revised Forest Plan establish management direction for grassy openings at a programmatic level. Site-specific considerations during project planning and decision-making will determine where they are established and maintained.

**349. Public Concern: The Forest Service should use native grass species to restore disturbed sites and clearings.**

**Response:** Site-specific considerations during project planning and decision making determine which species will be used.

**350. Public Concern: The Forest Service should consult with partner agencies and academics to promote open grassy oak forests or pine-oak woodlands in uplands.**

**Response:** Our intent is to look at physical and biological characteristics of a site. Please see Objective 1.1.F. in Chapter 2 of the Revised Forest Plan.

**351. Public Concern: The Forest Service should disregard biased viability analysis and create open-areas and grasslands.**

**Response:** We followed a process developed by Forest Service specialists that considers multiple requirements of forest planning regulation.

**352. Public Concern: The Forest Service should not manipulate the forest to create grasslands, savannahs, pine forests, or open woodlands.**

**Response:** These areas may break up a uniformly forested viewshed; however, not everyone views such conditions as visually unpleasant. Scientific evidence indicates that a limited amount of grasslands were among the many conditions found in eastern Kentucky's pre-European landscape (see Viability section in Chapter 3 of the FEIS).

## Transportation

### TRANSPORTATION MANAGEMENT DIRECTION

**353. Public Concern: The Forest Service should modify Objective 12.1A by removing the phrase "wherever possible."**

**Response:** Such a change would result in a statement that reads as if it were a standard. This direction was written as an objective, since road relocation may not always be possible or necessary.

**354. Public Concern: The Forest Service should designate Objectives 12.1.B and 12.1.C as standards.**

**Response:** We considered the suggestion but decided against it. Objectives 12.1.B and 12.1.C may or may not be attainable in any given year, but may be attainable over the planning period.

**355. Public Concern: The Forest Service should limit road building on forest land. The Forest Service should specify strong standards that limit road densities on the Forest. The Forest Service should decommission surplus roads.**

**Response:** The Revised Forest Plan, along with Forest Service handbooks and manuals, provide guidance for determining road needs as well as the need for road closure and decommissioning. Decisions on road construction, reconstruction, and decommissioning are best handled at the watershed or project level, based upon site-specific information and analysis. Density standards for open roads are established only when supported by site-specific, science-based analysis. An interdisciplinary science-based roads analysis at the appropriate scale will be used to inform planners and decision makers of needed and unneeded roads and to recommend priorities for implementation. When open road density standards are warranted, measures will be taken to enforce the standards. Objective 12.1.A applies to both roads and trails.

**356. Public Concern: The Forest Service should develop a standard that requires the closure of any road that creates adverse environmental effects or is costly to maintain.**

**Response:** We believe that Forestwide objectives under Goal 12 in the Revised Forest Plan meet this need.

**357. Public Concern: The Forest Service should modify several transportation related standards in the 1.G-Rare Communities Prescription Area, as recommended.**

**Response:** We considered the recommendations but concluded that the present standards are sufficient to provide for continuation and protection of the rare communities.

**358. Public Concern: The Forest Service should develop special road standards for the Habitat Diversity Emphasis Area.**

**Response:** Road management objectives for individual roads are developed with consideration of the purpose and need for the road, and help determine road design elements, including surfacing and maintenance. This planning is done in accordance with Forest Service handbooks and manuals, and must comply with management direction in the Revised Forest Plan, including the objectives within Goal 12.

**359. Public Concern: The Forest Service should clarify how Forestwide standard DB-VEG-11 applies to roadside maintenance activities within the Daniel Boone National Forest.**

**Response:** The standard as worded does not include any qualifications, so any use of herbicides whether along roads or elsewhere must be posted.

**360. Public Concern: The Forest Service should modify standards DB-ENG-1-4 to protect riparian areas, as recommended. The Forest Service should specify in DB-ENG-1 that protected zones for caves and sinkholes include the entire cave watershed. The Forest Service should modify Goal 12.1 and Objective 12.1.A, as recommended. The Forest Service should ensure that standards protect aquatic resources from effects of increased road use and maintenance.**

**Response:** We considered the recommendations but decided not use them to make changes. An interdisciplinary, science-based roads analysis at the appropriate scale will inform planners and decision makers whether roads are needed or unneeded roads and will recommend priorities for implementation. Road standards should be established only when supported by site-specific, science-based analysis. Decisions on road construction, reconstruction, and decommissioning are best handled at the watershed or project level, based upon site-specific information and analysis.

## ROAD MANAGEMENT

**361. Public Concern: The Forest Service should oppose construction of any new interstates or highway corridors through the forest, and establish standards that protect the forest from these activities.**

**Response:** Highway projects can have undesirable effects on national forest resources, but they can also meet important needs of local communities and society in general. A national Memorandum of Understanding between the Forest Service and the Federal Highway Administration (FHWA) specifies that the Forest Service will have opportunities to provide input to the FHWA on federal highway projects that could have effects on national forest land. The Daniel Boone National Forest provides such input for the environmental analysis for federal highway proposals that affect National Forest, including information pertaining to whether the proposal is consistent with management direction and desired future conditions in the Revised Forest Plan.



**362. Public Concern: The Forest Service should correct inconsistencies in Tables 2-30, 2-32, and C-2.B.**

**Response:** Appropriate changes have been made in the tables.

**363. Public Concern: The Forest Service should inventory and map all roads and trails, specify roads and road densities for management prescriptions. The effects of roads and road construction and maintenance should be analyzed and disclosed. The Forest Service should conduct a roads analysis, close more roads, list roads to be decommissioned, and list roads that create environmental ill effects or are too costly to maintain.**

**Response:** The effects analysis at the programmatic, forest plan level is useful in comparing and evaluating alternatives on a Forestwide basis. However, it is not intended to provide sufficient detail to be applied to specific locations on the National Forest. Potential effects of additional roads were considered in the analysis of environmental consequences, based upon existing forest conditions as well as standards and guidelines in existing handbooks and manuals. A Forest-scale roads analysis has been completed to help inform decision makers. Again, it was not intended to provide site-specific analysis. Watershed and project-scale analysis will be used to inform site-specific project decisions. It is at these levels of analysis that changes in management for individual roads will be identified and the effects of implementing a project alternative will be evaluated and disclosed. Density standards for open roads should be established only when supported by site-specific, science-based analysis. Relying on an interdisciplinary, science-based roads analysis at the appropriate scale, planners and decision makers will determine whether roads are needed and then recommend priorities for implementation. For these reasons we have decided against establishing road density standards in the Revised Forest Plan.

**364. Public Concern: The Forest Service should not use taxpayer money to study a proposed route for Interstate 66 through the Forest. The Forest Service should request that the Kentucky Department of Transportation restore the name “Daniel Boone Parkway” to what has recently become the “Hal Rogers Parkway.”**

**Response:** These concerns are outside the scope of the Revised Forest Plan because the Kentucky Transportation Cabinet and the Federal Highway Administration are the agencies responsible for this study, not the Forest Service.

**365. Public Concern: The Forest Service should provide adequate parking areas at gated roads, access points, and rights-of-way.**

**Response:** Forestwide Goal 12 generally gives such direction. Specific site design is not considered at the programmatic, forest-plan level.

**366. Public Concern: The Forest Service should identify the basis upon which the assertion is made that temporary roads result in minimal loss of soil productivity.**

**Response:** Chapters 2 and 3 of the Revised Forest Plan, along with the Forest Service Manual and handbooks provide for the protection of soils. The effects of temporary roads have been removed in the FEIS as indicators of “Short-Term Effects” and are shown as “Long-Term Effects.”

**367. Public Concern: The Forest Service should explain how road densities affect rare aquatic species, diversity, and habitat.**

**Response:** Road densities were not used to answer the questions you pose. See the Response to Public Concern 363.

**368. Public Concern: The Forest Service should ensure that new bridges are constructed to be “bat-friendly.”**

**Response:** Such construction standards may be considered and recommended on a site-specific basis for bridges on both National Forest System roads and state and county roads.

**369. Public Concern: The Forest Service should ensure that well-designed culverts are used, including flood-plain culverts. The Forest Service should modify Forestwide standard DB-ENG-3 and conduct a complete environmental review when considering potential stream crossings. The Forest Service should engineer stream crossings and hardened crossings to allow natural movements of aquatic species during normal flow periods.**

**Response:** Road design, including culvert design and placement, is done in accordance with Forest Service handbooks and manuals and reflects the road objective. This concern is best addressed at a watershed or project decision level. An interdisciplinary, science-based roads analysis at the appropriate scale will be used to inform planners and decision makers of needs for specially designed water crossings. Existing direction provides for the passage of aquatic animals during normal stream flow.

**370. Public Concern: The Forest Service should specify a standard that temporary access roads may be built in riparian areas.**

**Response:** This direction can be found in 1.E-Objective-5.B.

## TRAIL MANAGEMENT

**371. Public Concern: The Forest Service should better maintain Daniel Boone National Forest hiking trails. Standards for trails should require posting of allowed and prohibited uses at trailheads and in published materials. Also, physical barriers should be erected and trail rules strictly enforced to protect trails.**

**Response:** These types of recommended activities are considered during implementation of the Revised Forest Plan and will be utilized based upon the site-specific conditions.

**372. Public Concern: The Forest Service should inspect and maintain trails annually, and maintain trails to Best Management Practices at least every three years.**

**Response:** The objective of maintaining 20 percent of our trails annually does not mean every trail will get attention only every 5 years. This objective allows us to focus on those trails that may need more frequent attention while other trails may not need attention so often. Some Daniel Boone National Forest trails get attention almost annually. Overall, we should be maintaining 20 percent of our total miles annually.

**373. Public Concern: The Forest Service should develop a comprehensive plan for the Sheltowee Trace Trail and partner with agencies to develop standards for marking and maintaining the trail.**

**Response:** Such a strategy already exists.

**374. Public Concern: The Forest Service should specify trails that will be closed and explain the reasons for closure.**

**Response:** This will be done on a site-specific basis as we move to implementing the Revised Forest Plan.

## Recreation

### RECREATION MANAGEMENT (GENERAL)

**375. Public Concern: The Forest Service should clarify the description of ‘experiences’ on page 3-46 of the Plan.**

**Response:** Recreation experiences relate to how recreationists may respond to the setting they encounter on their visit to a national forest (remoteness, facilities, concentrations of people, etc.). People react differently to different levels of facility development and/or levels and types of contacts with other users. For instance, some may feel fearful in a remote, primitive setting and prefer more conveniences while others prefer the serenity of a remote setting.

**376. Public Concern: The Forest Service should designate the Clifty Wilderness and Wolfpen Roadless Area as primitive under the Recreation Opportunity Spectrum.**

**Response:** According to current interpretation of “primitive,” there are almost no places in the eastern U.S. that would qualify for this classification, especially when compared to areas of the western U.S. In addition, there are locations within the Wolfpen area where heavy recreation use occurs, making it even more difficult to classify it as a primitive setting.

**377. Public Concern: The Forest Service should prohibit development of forest land for highly developed uses such as golf courses, highways, and motorized uses.**

**Response:** To institute a blanket prohibition of such developments would not be in keeping with public sentiment. The Revised Forest Plan provides for a balanced spectrum of diverse recreation uses legally recognized as legitimate uses of a national forest. The vast majority of the National Forest is relatively undeveloped, but there are opportunities for development in certain areas. However, developments such as you mention would be few, and any proposal would have to undergo public scrutiny and input on a site-specific basis prior to approval.

**378. Public Concern: The Forest Service should emphasize recreation on forest land instead of timber harvest.**

**Response:** We do have an emphasis on recreation. However, we also must protect and maintain the health of our natural resources through various means, including the judicious use of timber harvest.

**379. The Forest Service should not emphasize the “sale” of recreation as a marketable product.**

**Response:** We do not manage recreation from a strict economic viewpoint, nor is it our intent to “sell” any programs. When deciding whether to invest public funds, however, we should consider the differing values, to the public we serve, of various recreational activities.

**380. Public Concern: The Forest Service should implement concrete steps to reduce the environmental effects of recreation. The EIS minimizes the full impact of recreation.**

**Response:** We believe we have adequately recognized and addressed recreation impacts in the EIS and included direction in the Revised Forest Plan to address this issue. However, the Revised Forest Plan is a broad programmatic document and more detailed mitigation will be prescribed as site-specific projects are evaluated through the environmental analysis process.

**381. Public Concern: The Forest Service should explain how backcountry and high quality recreation along with scenic protection are provided on the Forest given the low amounts of wilderness as well as roadless, primitive, and remote areas.**

**Response:** Public input has helped us establish the types and quality of recreation made available on the National Forest. We believe we have adequately provided for the types of qualities you mention. “High quality recreation” is perceived differently by different persons, as is the desire of the public for “back country” experiences. Land that doesn’t qualify as “back country” for some, may be regarded as “wilderness” by others. We also believe we have provided for appropriate levels of scenic protection. Past public input and the 2002 National Visitor Use Monitoring Project give evidence of the public’s satisfaction with Daniel Boone National Forest scenery. In this survey, the public rated the National Forest’s scenic quality 4.6 out of 5.0.

**382. Public Concern: The Forest Service should provide more dispersed, non-motorized recreation opportunities and trails and reduce the areas impacted by motorized recreation and extractive development.**

**Response:** Based on public input we believe we have provided the appropriate mix of recreation opportunities within management limitations and the land’s capabilities.

**383. Public Concern: The Forest Service should analyze job gains created by recreation and people relocating to live near the forest.**

**Response:** The significant social and economic effects of the alternatives are displayed in Chapter 3 of the FEIS under the Socioeconomic Environment.

**384. Public Concern: The Forest Service should ensure that all commercial, non-motorized recreational activities are subject to strong guidelines, public involvement, required permits, and monitoring and enforcement.**

**Response:** Our special use policy, including environmental analysis required by the National Environmental Policy Act, is used for approval of such activities on a case-by-case basis. All permits include provisions to protect the environment.

**385. Public Concern: The Forest Service should clarify Goal 7.4 by defining “wildlife resistant facilities.”**

**Response:** Goal 7.4 and the associated objective in the Revised Forest Plan have been reworded for clarification. The term “wildlife resistant” is used as an alternative to such an outmoded term such as “bear proof” garbage cans. Rather than specie specific, (e.g. bear) the term wildlife is used to include other species (e.g. raccoons, opossums, bees).

**386. Public Concern: The Forest Service should develop low-impact recreation on appropriate areas of the Forest, especially areas that would help local economies.**

**Response:** We are planning on providing recreation areas that meet public needs and help local economies, with minimum environmental impacts.

**387. Public Concern: The Forest Service should develop standards requiring Limits of Acceptable Change (LAC) for horseback riding, Cave Run Lake, Laurel River Lake, and the Red River Gorge.**

**Response:** We agree that the LAC process would be helpful in the areas you mention. Objective 3.A. of the Red River Gorge prescription area calls for use of the LAC process and we have already started the process for the Red River Gorge and will further explore this process for other areas as we implement the Revised Forest Plan.

**388. Public Concern: The Forest Service should not construct recreational facilities near heritage sites, nor areas with proposed, endangered, threatened, and sensitive species within cliffline zones.**

**Response:** While we feel that facilities, such as some trails, should be limited in this area we believe we need the flexibility to be able to enter this zone when impacts to these sensitive areas can be mitigated or avoided. There are such facilities that have been historically in this zone prior to it being established and these facilities are not causing unacceptable impact.

## ECOTOURISM

**389. Public Concern: The Forest Service should emphasize ecotourism on the Daniel Boone National Forest.**

**Response:** We are involved in ecotourism councils and activities and try to ensure that these are considered in our management activities.

## USER CONFLICTS

**390. Public Concern: The Forest Service should provide a more detailed analysis and disclosure of “user conflict” effects in the Forest Plan’s Summary of Issues.**

**Response:** Such analysis is done primarily for site-specific projects and is not integral to the Revised Forest Plan management direction or EIS analysis of environmental consequences. This part of the Revised Forest Plan is simply a general statement as to what may occur when managing for different types of recreation opportunities.

## RECREATION TYPES/OPPORTUNITIES

**391. Public Concern: The Forest Service should take into account the needs of recreational users for activities such as hiking, rock climbing, and mountain biking.**

**Response:** We considered the recommendation but we believe we have adequately addressed these activities in the Revised Forest Plan. We also believe that the FEIS adequately states the issues and addresses the concerns related to these recreation activities.

## MOTORIZED RECREATION (GENERAL)

**392. Public Concern: The Forest Service should provide adequate off-highway vehicle opportunities on the Daniel Boone National Forest.**

**Response:** We plan on continuing to provide more miles of environmentally sustainable off-highway vehicle (OHV) trails on the National Forest. Forestwide Goals 7.3 and 12.2 will lead to providing more OHV opportunities, and Objective 12.2.A. will result in improved user experiences on trails designated for OHVs.

**393. Public Concern: Motorized OHV use is destructive to National Forest and nearby private lands, and not in accord with how the National Forests should be managed. Much of this use is illegal. The Forest Service should ban/limit motorized recreational use and off-highway vehicle use on National Forest land.**

**Response:** Not all off-highway vehicle (OHV) use is destructive. We have provided for a limited amount of this activity as part of a broad spectrum of diverse and legally recognized recreation activities. The Revised Forest Plan provides for this activity in an environmentally sound manner. Because inadequately managed use of OHVs can be destructive, we have provided management direction in the Revised Forest Plan for resource protection. We will continue to address illegal activities while providing for legitimate recreational uses.

**394. Public Concern: The Forest Service should better analyze the effects of off-highway vehicle use. There should be more differences in effects from this use between alternatives than what the DEIS indicates.**

**Response:** Although total projected off-highway vehicle (OHV) trail length varies between 0 and 126 miles between the alternatives (EIS, Chapter 2, Issue 11), this impact occurs within a large (700,000 acre) analysis area. From this perspective, we found that the differences in OHV impact to resources would be negligible, given proper design, maintenance, and elimination of illegal trails, which is planned under Goal 12 (See FEIS, Chapter 3, Soil and Water).

**395. Public Concern: The Forest Service should utilize mitigation technologies rather than closing or rerouting off-highway vehicle trails that do not meet management objectives.**

**Response:** Mitigation techniques, other than closure or rerouting, are used whenever possible. However, in some circumstances closure or rerouting may still be necessary.

**396. Public Concern: The Forest Service should prohibit off-road vehicle use in the Rare Communities Prescription Area.**

**Response:** Off-highway vehicles are prohibited in rare community sites (1.G-REC-1). Within the broader rare community management zones, off-highway vehicle use is permitted only on trails designated for that use. Site-specific analysis will determine the course of action to take if these trails and rare communities overlap.

**397. Public Concern: The Forest Service should change the definition of “semi-primitive motorized” as there is nothing primitive about motorized recreational uses.**

**Response:** This is a standard classification that has been used nationwide for many years, and we believe it is still useful. The prefix “semi-” indicates that the area is partially primitive.

**398. Public Concern: The Forest Service should change Objective 12.1.D to a goal.**

**Response:** The objective has been restated as a goal, as suggested.

**399. Public Concern: The Forest Service should change Objective 12.1.E to a standard.**

**Response:** We considered the recommendation but decided that the objective should remain as stated in the Proposed Revised Forest Plan because there may be circumstances where a 150-mile minimum is not feasible or desirable. Changing the objective to a standard would not afford us the flexibility to accommodate such circumstances.

**400. Public Concern: The Forest Service should rewrite Standard 5.C-REC-1 to exclude off-highway vehicle use in Zone 2.**

**Response:** We utilized direction from the Kentucky Division of Water pertaining to which zones should exclude off-highway vehicle use. Project-level analysis can require additional standards.

**401. Public Concern: The Forest Service should not allow timber vehicles on trails.**

**Response:** With adequate safety precautions, this temporary condition may be necessary in some places.

## **VOLUNTEER SUPPORT FOR TRAIL MAINTENANCE**

**402. Public Concern: The Forest Service should work with off-highway vehicle clubs and recruit them to participate in adopt-a-trail programs.**

**Response:** We have had several partnerships with off-highway vehicle volunteers and would like to see this program expand (see Goal 14 in the Revised Forest Plan).

## **OFF-HIGHWAY VEHICLE FEES AND PERMITS**

**403. Public Concern: The Forest Service should implement a fee-based system for off-highway vehicle use.**

**Response:** This fee system is already being implemented under a national demonstration program and will continue as long as the program remains in effect and where there is an adequate trail system. The White Sulphur ATV system on the Morehead Ranger District has been a fee area for two years.

## **ENFORCEMENT OF OFF-HIGHWAY VEHICLE REGULATIONS**

**404. Public Concern: Illegal OHV activity is a major problem and no new trails should be built until this problem is brought under control. The Forest Service should also educate off-highway vehicle users, post allowed uses, and install physical barriers.**

**Response:** Illegal off-highway vehicle (OHV) activity is treated similarly in all alternatives considered for the Revised Forest Plan. This includes public education, appropriate signing and physical barriers. We will continue to target illegal OHV use for enforcement efforts as workforce constraints and other law enforcement priorities allow. Building no new trails penalizes the law-abiding public and could even increase illegal use in places. Where we have adequate trails, we find a reduction of illegal use.

## TRAILS (GENERAL)

**405. Public Concern: The Forest Service should incorporate user-created trails into the existing trail system.**

**Response:** The vast majority of these illegal trails are poorly located and cause much resource damage. In most cases, the Daniel Boone National Forest does not have the resources to properly maintain all these trails, so they are normally targeted for closure. Occasionally, some of these trails have been added to the system where appropriate.

**406. Public Concern: The Forest Service should develop criteria for establishing new off-highway vehicle trails.**

**Response:** Standards, goals, and objectives in the Revised Forest Plan, along with various Forest Service manuals and handbooks, include the management direction and guidance needed to provide for environmentally sustainable off-highway vehicle trail systems. Further detailed criteria are developed on a site-specific basis.

**407. Public Concern: The Forest Service should establish off-highway vehicle trails on inactive, private strip-mining property.**

**Response:** The Forest Service has no authority for such developments on private lands. However, Forestwide goals provide for cooperation with the local community in economic development and such cooperative trail development could be a possibility.

**408. Public Concern: The Forest Service should create a broader spectrum of recreational opportunities desired by off-highway vehicle user groups with various levels of expertise.**

**Response:** Unfortunately, we do not have the ability to provide all types of recreation experiences for all levels of users. Our goal is to provide a broad array of experiences within the capabilities of the agency and the land. However, additional opportunities could be provided on a case-by-case basis if financially sustainable and environmentally sound.

**409. Public Concern: The Forest Service should use a variety of connected roads and off-highway vehicle trails, which may, individually, be less than 15 miles long.**

**Response:** We agree that individual trails need not be 15 miles in length, and that the overall riding experience, including connections to other systems is what's important. That is why we have emphasized riding "opportunities" rather than "trails."

**410. Public Concern: The Forest Service should close more off-highway vehicle trails than proposed.**

**Response:** Chapter 2 of the Revised Forest Plan provides for evaluating trails on a regular basis and closing them where needed. We may, indeed, close more trails than estimated in the Revised Forest Plan.

**411. Public Concern: The Forest Service should use Symms Act Recreational Trail Program funds to build trails in southeastern Kentucky near London.**

**Response:** This recommendation is outside the scope of the Revised Forest Plan. If there is a decision to construct trails in this area, this funding source will be considered and used as it has been for past projects.



**412. The Forest Service should use seasonal closings of some trails if significant ill effects occur.**

**Response:** This is a good technique and will be considered on a trail-by-trail basis during implementation of the Revised Forest Plan.

**TRAILS (SPECIFIC)****413. Public Concern: The Forest Service should reopen the northern terminus of the Sheltopee Trace to off-highway vehicle travel.**

**Response:** This option has previously been examined and the decision to close it was made based on environmental concerns, illegal off-highway vehicle use, and damage issues associated with private land.

**414. Public Concern: The Forest Service should not close the Livingston area to off-highway vehicle use.**

**Response:** Most of the Livingston area used for off-highway vehicle (OHV) recreation is privately owned. The landowners have taken their own steps to close their lands to OHV use.

**415. Public Concern: The Forest Service should close the Lick Creek motorized trail.**

**Response:** The Revised Forest Plan's Forestwide standards provide a system for evaluating trails on a regular basis. Upon evaluation, the Lick Creek area may be closed if needed.

**416. Public Concern: The Forest Service should better analyze the proposed Redbird Crest off-road vehicle route.**

**Response:** The DEIS is a programmatic planning document to compare alternatives that can provide general direction for the future of the Daniel Boone National Forest. Site-specific concerns, such as the Redbird Crest OHV trail, are addressed at the project level rather than the forest plan level.

**OFF-ROAD MOTORCYCLE USE****417. Public Concern: The Forest Service should define, acknowledge, and provide for off-highway motorcycle (OHM) use on Forest land.**

**Response:** Off-highway motorcycle use is included in the off-highway vehicle (OHV) definition, since motorcycles may be used on all OHV trails. Single-track opportunities may become available in the future; however, due to financial and land limitations, we are not able to provide all the recreation opportunities desired. It is most economical to provide trails that can be shared by a variety of motorized uses.

**ROCK CLIMBING****418. Public Concern: The Forest Service should specify a minimum height above which the installation of fixed anchors does not require Forest Service authorization for route development.**

**Response:** We believe that specifying a minimum height will not accomplish the intended objective of streamlining the authorization process because it does not mitigate the concerns related to route establishment.

**419. Public Concern: The Forest Service should be more specific (amount, location, size) regarding the removal of vegetation in Standard 1.C-REC-2.**

**Response:** We believe the current wording is adequate because it allows for reasonable judgment to be made. An attempt to apply specifics for vegetation removal would presume that the environment at each site is unvarying, but that is not the case.

**420. Public Concern: The Forest Service should approve access trails for an entire wall/area.**

**Response:** The Revised Forest Plan standard at 1.C-REC-2 has been reworded, as suggested.

**421. Public Concern: The Forest Service should inform the climbing public prior to closing climber trails, and give climbers the opportunity to rehabilitate or reroute trails.**

**Response:** The public is notified prior to such actions. Volunteer assistance in such endeavors is appreciated and welcomed.

**422. Public Concern: The Forest Service should specify a standard regarding authorization requirements for bouldering route development in non-cliff areas.**

**Response:** Bouldering route development in non-cliffline communities is now addressed in Chapter 2 of the Revised Forest Plan with the standard at DB-REC-6.

**423. Public Concern: The Forest Service should reconcile the difference between the desired future conditions stating that uses such as climbing are “generally allowed” and the standards for route approval relative to archeological resources.**

**Response:** The phrase “generally allowed” does not mean that there will be no climbing restrictions. Nevertheless, Standard 1.C-REC-2 has been reworded and no longer specifically mentions archeological resources.

**424. Public Concern: The Forest Service should allow climbers to add metal plates and soil at the base of rock climbing areas and use climbing areas until archaeological studies are conducted.**

**Response:** We will provide for mitigation of resource damage, where possible, on a case-by-case basis since each situation presents its own unique challenges.

**425. Public Concern: The Forest Service should incorporate all standards related to rock climbing into the Cliffline Community recreation standard 1.C-REC-2.**

**Response:** Except for standards specific to Wildernesses, nearly all standards related to rock climbing are within the Cliffline Community prescription area. A standard pertaining to bouldering was made Forestwide because bouldering could take place away from the areas falling into the Cliffline Community prescription area.

**426. Public Concern: The Forest Service should better analyze various climbing issues.**

**Response:** We believe that we have adequately addressed the significant items related to rock climbing and its associated trails. The Limits of Acceptable Change process to be conducted for the Red River Gorge, and additional monitoring, will provide additional analysis of climbing issues.

**427. Public Concern: The Forest Service should develop sub-goals and objectives for rock climbing, as recommended.**

**Response:** Goal 7.3 has been modified to include rock climbing.

**428. Public Concern: The Forest Service should educate and manage rock climbers to address serious adverse impacts in the Red River Gorge.**

**Response:** The Forest Service and the rock climbing community are working together to address these concerns.

**429. Public Concern: The Forest Service should develop a quota system to limit the number of people in the Red River Gorge to help reduce overuse from hiking and rock climbing.**

**Response:** Quotas for use of public lands have not generally been well received by the public. However, we understand your concerns and will be working through the Limits of Acceptable Change process with the public to address overuse issues.

**430. Public Concern: The Forest Service should survey proposed new climbing routes to protect natural resources.**

**Response:** Proposals requiring authorization by the Forest Service will be subject to the environmental analysis requirements of the National Environmental Policy Act. Some level of survey will typically be part of this analysis process.

**431. Public Concern: The Forest Service should survey existing climbing areas for sensitive resources and develop limits of acceptable change, but leave all existing routes open during this process.**

**Response:** For the most part, management direction in the Revised Forest Plan is consistent with your survey suggestion, and we believe this direction will adequately protect resources and provide for climbing opportunities. However, it may be necessary to close some routes prior to completion of the Limits of Acceptable Change process if they are resulting in excessive damage to forest resources.

**432. Public Concern: The Forest Service should modify language in the DEIS related to rock climbing to reflect that there is quality rock climbing outside the Red River Gorge, and also correct statements that exaggerate the status of rock climbing on the Forest.**

**Response:** We realize that the Revised Forest Plan can be interpreted differently, depending on a reader's perspective. While we may not agree with the commenter's characterizations of certain text, we have made some modifications that we think better reflect the rock climbing situation.

**433. Public Concern: The Forest Service should clearly define the term "fixed anchors," specify that slings or chocks are not permanent installations, and allow the use of safety bolt installation.**

**Response:** The Revised Forest Plan has been reworded to address slings and chocks more accurately. If these are left in the Forest they still have similar adverse effects as bolts and are still considered "fixed." We will continue to manage our designated Wildernesses as specified in the Revised Forest Plan. Even though this may present too much of a challenge and risk for some, it is in keeping with Wilderness legislation.

**434. Public Concern: The Forest Service should clarify the historical number of climbing routes existing in the Red River Gorge on page 3-243 of the DEIS.**

**Response:** We realize that historical information regarding numbers of climbing routes is not easily verified and have reworded the FEIS to avoid references to specific numbers of routes.

**435. Public Concern: The Forest Service should provide the full spectrum of ROS experiences for the various climbing opportunities that climbers seek.**

**Response:** The Cliffline Community prescription area, where climbing occurs, was developed for the unique natural ecosystem it provides and will continue to be managed for the ROS categories stated in the Revised Forest Plan.

**436. Public Concern: The Forest Service should give district rangers the discretion to approve new climbing areas regardless of the presence of fixed anchors, constructed trails, removal of vegetation, or known archaeological sites.**

**Response:** With appropriate analysis and public input, district rangers have the authority to make individual decisions. (A deviation from the Revised Forest Plan will require a project-specific amendment to the Revised Forest Plan.) The district rangers have provided input, review, and approval of the direction contained in the Revised Forest Plan and believe it provides the appropriate consistency of protection for cliffline resources.

**437. Public Concern: The Forest Service should modify Standard 2.A-REC-5 to allow maintenance or replacement of fixed anchors within existing climbing areas in the Clifty Wilderness.**

**Response:** We have considered the recommendation but we believe the current wording for this rock-climbing standard is appropriate for the Clifty Wilderness.

**438. Public Concern: The Forest Service should not treat climbing, bouldering, and rappelling the same, because these are different activities.**

**Response:** We believe the current standards for climbing, bouldering, and rappelling adequately reflect any differences. For example, DB-REC-6, regarding bouldering, was made a Forestwide standard because we recognize that the activity could take place outside the Cliffline Community prescription area.

**439. Public Concern: The Forest Service should modify Standard 1.C-REC-2 to require authorization of climbing routes located within 300 feet of a known cave or rockshelter.**

**Response:** We agree that caves and rock shelters require adequate protection, and such will occur with the site-specific analysis that will be part of any authorization of new climbing routes.

**440. Public Concern: The Forest Service should develop a climbing management plan for managing rock climbing, bouldering, and rappelling.**

**Response:** The National Forest Management Act requires that each national forest develop and maintain a single comprehensive management plan covering all forest resources and uses. The analysis and public involvement that will occur during the Limits of Acceptable Change process for the Red River Gorge (3.E-Objective 3.A.) may identify additional management direction pertaining to rock climbing, bouldering, rappelling, and other recreation activities, that should be amended into the Forest Plan.

**441. Public Concern: The Forest Service should work with climbing groups to solve climbing related problems on the Daniel Boone National Forest.**

**Response:** We will continue to work with climbing organizations to achieve the goals of quality climbing opportunities and protection of natural resources.

## MOUNTAIN BIKING

**442. Public Concern: The Forest Service should support mountain biking activities on Forest land.**

**Response:** Goal 12.2 of the Revised Forest Plan provides management direction that is applicable to trails for mountain biking.

## HIKING AND CAMPING

**443. Public Concern: The Forest Service should manage the Sheltolee Trace as a long-distance hiking trail.**

**Response:** We will be evaluating the future management of the Sheltolee National Recreation Trail as part of an overall evaluation of Forest trails.

**444. Public Concern: The Forest Service should add fire-building as a prohibited activity under Standard 1.C. REC-3.**

**Response:** This activity has been added to the standard, as suggested.

**445. Public Concern: The Forest Service should modify 1.G-Objective-1.D and prohibit camping in rare communities.**

**Response:** Monitoring of rare communities will allow action to be taken as needed.

## HUNTING AND FISHING

**446. Public Concern: The Forest Service should promote hunting and fishing on Forest land but not allow use of ATVs to pursue or retrieve game.**

**Response:** The Forest Service works with the Kentucky Department of Fish and Wildlife Resources to promote hunting and fishing. Kentucky law prohibits pursuit of game with motorized vehicles.

## EQUESTRIAN RECREATION

**447. Public Concern: The Forest Service should modify Standard 2.A-REC-1 and allow equestrian use in the Clifty and Beaver Creek wilderness areas.**

**Response:** Horseback riding is allowed on designated trails in these two Wildernesses.

**448. Public Concern: The Forest Service should open more Forest land to equestrian and other uses.**

**Response:** Approximately 65 percent of the National Forest System trails on the Daniel Boone National Forest are open to horse use.

## OTHER RECREATION

**449. Public Concern: The Forest Service should identify and provide access to recreational caves.**

**Response:** There are currently no designated recreational caves on the National Forest.

**450. Public Concern: The Forest Service should clearly define and provide details regarding “recreation residence lot.”**

**Response:** A sub-section has been added to the Recreation section in Chapter 3 of the FEIS to explain and disclose the extent of this activity on the Daniel Boone National Forest.

**451. Public Concern: The Forest Service should disclose how the effects of recreational mining will be determined.**

**Response:** This activity has seldom, if ever, occurred on the Daniel Boone National Forest, because “recreational” minerals and/or the demand for such are so limited. However, a Forest Service directive for the Southern Region requires inclusion of Standard 1E-Min-3 in the Revised Forest Plan. Additional direction is provided in the Forest Service Minerals Handbook (2860). If recreational mining were proposed, a site-specific analysis would determine the effects and be used in the decision-making process.

## DEVELOPED FACILITIES

**452. Public Concern: The Forest Service should specify a standard to install compost toilets, low-flow showerheads, and other conservation oriented appliances at developed recreation sites.**

**Response:** This is a more site-specific decision than would be found in a programmatic document such as the Revised Forest Plan. Decisions to use conservation-oriented facilities would be made on a site-specific basis depending on the circumstance and facility development. Where feasible, we do attempt to provide conservation-oriented facilities.

**453. Public Concern: The Forest Service should place emphasis on undeveloped and low-developed facilities in the Plan’s goals and objectives.**

**Response:** We do emphasize lesser-developed facilities. The more-developed facilities in Development Levels 4 and 5 are existing campgrounds and boat ramps constructed on Cave Run and Laurel River Lakes when these impoundments were created.

**454. Public Concern: The Forest Service should not establish a level 2 campground with hook ups in the Red River Gorge.**

**Response:** RV hook ups would not be included in a Level 2 campground. A Level 2 would probably have only primitive toilets, lantern posts, and fire rings for tent camping. In contrast, Koomer Ridge Campground is a Level 4 campground, which is much more developed than a Level 2.

**455. Public Concern: The Forest Service should promote low-impact camping and picnic sites.**

**Response:** We will continue to promote these facilities. Costly or poorly used facilities will be considered for closure.

## Cave Run Lake Resort

**456. Public Concern: The Forest Service should not develop a resort lodge or golf course at Cave Run Lake. A site-specific project such as this does not belong in a programmatic document such as the Revised Forest Plan.**

**Response:** Disclosure of this “opportunity” in the Revised Forest Plan does not negate the need for site-specific analysis and public involvement if a corresponding development is proposed. There is no guarantee that a resort lodge will ever be built, nor has there been any decision as to what kinds of facilities would be built. The Revised Forest Plan makes no mention of a golf course. While this is a site-specific opportunity, it was already provided for in the 1985 Forest Plan and preliminary disclosure seemed to be prudent due to public interest in such a project.

## FEE DEMONSTRATION PROJECT AND USER FEES

**457. Public Concern: The Forest Service should rely more on donations and fund raising events and not rely on fees and permits.**

**Response:** We have found that donated funds and labor do not come close to meeting the budget shortfalls we have experienced. Therefore, fees may be required at times.

## RECREATION EDUCATION

**458. Public Concern: The Forest Service should install trash cans at trailheads and popular camping areas, and educate Forest users on how to properly clean-up after their recreational activities.**

**Response:** We continually work on this problem through education and law enforcement. The PRIDE Program, which is continuing to experience success, is helping to change the attitude of many who visit and live near the National Forest. Although there are many trash receptacles at most developed sites, most of the National Forest operates on a “Pack it in – Pack it out” basis. Additional trash collection is limited by the recreation budget.

## SCENERY AND VISUAL RESOURCES (AESTHETICS)

**459. Public Concern: The Forest Service should better analyze aesthetic protection.**

**Response:** While we do not get into specifics of scenery management in the Revised Forest Plan, we will use existing Forest Service guidance to manage the National Forest’s scenery. The Forest Service Handbook concerning scenery management provides appropriate guidance to meet visual quality needs.

## Special Designations

### ROADLESS AREAS AND WILDERNESS

**460. Public Concern: The Forest Service should place less emphasis on roadless and wilderness areas and emphasize access development that will enhance forest health.**

**Response:** We believe the Revised Forest Plan strikes an appropriate balance between the values associated with forest that is less influenced by human activity and the need to manage the forest so that the other conditions and uses are sustained. The preferred alternative proposes no new wilderness designations but retains the existing roadless character of the area (3E-Goal-7). The Record of Decision includes the rationale for the Selected Alternative, including why the Regional Forester believes the balance of management emphases it reflects is most appropriate.

**461. Public Concern: The Forest Service should recommend additional Forest land as wilderness, including the Wolfpen Area as a wilderness study area and recommend its addition to the Clifty Wilderness Area.**

**Response:** While the Wolfpen area has many positive characteristics when considering it as a Wilderness Study Area, it also has some heavy dispersed use in various places that would make it very difficult to properly manage and maintain as a wilderness. Thus, we believe its current management as a semi-primitive non-motorized area best serves the public and continues to allow the recreational uses currently found there. We do not believe that comparison with other national forests, which have different lands and uses, is necessarily a criterion that we should use to determine how much wilderness the Daniel Boone National Forest can, or should, provide.

**462. Public Concern: The Forest Service should assess priorities for desired lands to be managed for natural (wilderness-like) features and measure success toward such goals.**

**Response:** We believe that a reasonable balance has been achieved in the diversity of land uses within the Forest, including wilderness-like lands.

**463. Public Concern: The Forest Service should analyze wilderness demand and supply, independently and in comparison.**

**Response:** Please see Wilderness supply and demand analysis in the Assessment of the Management Situation and section on Wilderness (Existing and Proposed) in the FEIS.

**464. Public Concern: The Forest Service should designate additional areas as roadless, as recommended, and provide protection.**

**Response:** We respectfully disagree with several of your assumptions and characterizations of the roadless and wilderness issues and believe that we have adequately analyzed these resources and have provided a balance of land allocations, including those you mention.

**465. Public Concern: The Forest Service should remove all culverts and other structures associated with roads that will be closed in the Clifty and Beaver Creek Wilderness.**

**Response:** Any removal of culverts and similar structures should be based on site-specific project level analysis not the programmatic analysis of this plan. This is most important when aquatic communities and federally listed species are involved. An objective of the Riparian Corridor Prescription Area is to inventory these types of aquatic barriers on a forestwide basis.



**466. Public Concern: The Forest Service should modify Prescription Area 2.A, Clifty Wilderness, and Prescription Area 2.B, Beaver Creek Wilderness, as recommended.**

**Response:** Changes have been made where appropriate. Some standards are appropriate for this Wilderness and best protect its Wilderness values.

**467. Public Concern: The Forest Service should add portions of the Beaver Creek Wildlife Management Area to the Beaver Creek Wilderness.**

**Response:** The analysis of potential wilderness study areas did not find these areas to be suitable.

**468. Public Concern: The Forest Service should establish a wilderness area on the Redbird District west of Buckhorn Lake.**

**Response:** There is insufficient National Forest System land west of Buckhorn Lake to form a wilderness area.

## HERITAGE AND CULTURAL RESOURCE MANAGEMENT

**469. Public Concern: The Forest Service should incorporate more proactive measures towards protecting archaeological resources and should implement the Department of Interior's standards for archeology and historic preservation, and all appropriate laws, regulation, and guidance.**

**Response:** Existing laws and regulation provide adequate protection of archeological resources and will be followed. Additional proactive measures will occur based upon financing and available resources.

**470. Public Concern: The Forest Service should enhance the public education programs for heritage resources and provide guidance to forest users.**

**Response:** We agree, and will do so as funding permits.

## WILD AND SCENIC RIVERS

**471. Public Concern: The Forest Service should support wild and scenic river designation for several rivers, as recommended.**

**Response:** That is the intent of the plan. We appreciate your support.

**472. Public Concern: The Forest Service should conduct better analysis and disclose results regarding wild and scenic river designation on the Forest.**

**Response:** Please see Appendix D of the EIS. Goals, objectives, and standards in the Riparian Corridor prescription area are designed to maintain and improve water quality across the Daniel Boone National Forest. Forestwide direction also strives to improve water quality. In addition the Daniel Boone National Forest also is involved in the Kentucky Watershed Management Framework, which works on water quality issues.

**473. Public Concern: The Forest Service should provide access to the Rock Creek and Marsh Creek wild and scenic river segments.**

**Response:** There is some existing access.

**474. Public Concern: The Forest Service should modify Prescription Area 3.C.1, Red River Wild and Scenic River; 3.C.2, Proposed Wild and Scenic River: Marsh Creek Wild River Segment; 3.C.4, Proposed Wild and Scenic Rivers: Cumberland/War Fork/Rockcastle Segments; 3.C.5, Proposed Wild and Scenic River: Rock Creek and Marsh Creek Wild River Segments.**

**Response:** We believe the Plan provides as much protection as possible while protecting legal rights of private owners.

**475. Public Concern: The Forest Service should specify that the Marsh Creek Proposed Wild River Segment is unsuitable for timber production, as recommended.**

**Response:** This description has been changed and now matches the other wild and scenic river prescription areas.

**476. Public Concern: The Forest Service should coordinate with Kentucky Natural Resources and Environment Protection Cabinet on the proposed Marsh Creek Wild River segment.**

**Response:** This segment is not part of the state's wild and scenic river system.

## RESEARCH NATURAL AREAS AND NATURAL AREAS

**477. Public Concern: The Forest Service should designate Tight Hollow as a Research Natural Area or as designated old-growth.**

**Response:** If not selected as an RNA, the area will be moved into the Red River Gorge Geological Area where it will receive appropriate management (see standard 1A-Land).

**478. Public Concern: The Forest Service should avoid thinning and planting within most designated natural areas.**

**Response:** Site-specific project planning based on Plan direction will determine if these treatments are appropriate to achieve the desired future conditions for the particular prescription area.

**479. Public Concern: The Forest Service should establish at least one or more research natural area in each management area or at least one research natural area for each community type. The Forest Service should increase the scale of research natural areas to allow for research, as recommended to support large samples, comparative data, and species viability.**

**Response:** Research Natural Areas are established in cooperation with Forest Service research stations. Need for RNAs is based on representation of forest types in RNAs throughout the southeast as opposed to just Kentucky. If there is no need for more of a certain type, additional areas are not established.

**480. Public Concern: The Forest Service should apply the same management to all proposed research natural areas.**

**Response:** Management permitted within a Research Natural Area (RNA) is determined by the management plan specific to the RNA and developed by Forest Service research stations.

**481. Public Concern: The Forest Service should clarify whether fire will be used in the research natural areas.**

**Response:** The management plan for Rock Creek, an existing Research Natural Area (RNA), does not permit prescribed fire. Tight Hollow and Right Fork of Elisha Creek are proposed RNAs without management plans. If the proposed areas are accepted, the Southern Research Station will write a management plan for each area that could include prescribed fire.

**482. Public Concern: The Forest Service should establish large areas with little or no prescribed fire in the Rockcastle River, Redbird River, and Licking River watersheds.**

**Response:** The use of prescribed fire in a particular area will be determined by site-specific analysis in reference to Plan direction for a particular area.

**483. Public Concern: The Forest Service should map and better summarize, simplify, and combine displays and analysis of locations of wilderness-like or presettlement-like natural areas. The Forest Service should emphasize native plants and animals in planned natural areas, and distinguish between wilderness-like management and presettlement-like management.**

**Response:** The terms “wilderness-like” or “presettlement-like” and “natural areas” have not been defined. However, prescription area desired future conditions should give each reader a feeling as to whether the area meets their personal definition of such terms. Fifth-level watershed inventory and analysis will provide data that can be used to locate areas of interest at a more easily understood scale. The Plan promotes native species, but also allows for desired non-native species as directed by planning regulations.

## OTHER SPECIAL DESIGNATIONS

**484. Public Concern: The Forest Service should modify Prescription Area 3.F, Natural Arch Scenic Area; and 3.E, Red River Gorge Geological Area.**

**Response:** The proposed direction (Goals, Objectives and Standards) is appropriate as stated in the Plan and provides appropriate management, including protection, to achieve the desired future condition for these areas. Other specific measures will be implemented based on site-specific project level analysis.

**485. Public Concern: The Forest Service should protect the research plot on the 39-acre Reece Tract in the White Oak area.**

**Response:** Designation of lands specifically for research purposes was not deemed to be necessary at the programmatic level the Revised Forest Plan. However, there are several on-going research projects on the Forest that will be tracked and encouraged as long as such research is of interest. Each is tracked in our CISC database as “Special Study Area.”

## Lands and Special Uses

### LAND ACQUISITION AND EXCHANGE

**486. Public Concern: The Forest Service should establish specific forestwide goals, objectives, and standards related to the sitting and approval of future special uses. The Forest Service should implement new goals and standards related to special use permits, as recommended.**

**Response:** The Plan, along with Forest Service handbooks and manuals, provide adequate guidance for issuing special uses and provide for the recommended goals and standards. Regulations -- such as 36 CFR 251 Subpart B – Special Uses, FSM 2700, and FSH 2709.11 -- address this concern. Also see Forestwide goals and standards, as well as goals, objectives and standards in individual prescription areas.

**487. Public Concern: The Forest Service should consolidate scattered parcels of Forest land, and expand the size of the Forest. The Forest Service should allocate more funds for land acquisition.**

**Response:** Chapter 2 of the Plan, along with Forest Service handbooks and manuals, provide guidance for land acquisition. Congress and the market value of land determine the acquisition program every year. Priorities are re-examined as land becomes available for acquisition.

**488. Public Concern: The Forest Service should emphasize ecological needs over land consolidation and acquire lands that increase and protect the biodiversity of the forest.**

**Response:** Ecological needs are one of the many considerations in land acquisition and exchange. Chapter 2 of the Plan, along with Forest Service handbooks and manuals, provide guidance for land acquisition. Congressional appropriations and the market value of land determine the annual acquisition program. Priorities are re-examined as land becomes available for acquisition.

**489. Public Concern: The Forest Service should modify standard DB-LAND-1 to clearly define the term “inventory,” specify a time limit for the completion of inventories of new parcels, and modify all Plan standards to specify time limits.**

**Response:** DB-land-1 has been rewritten for clarification. If a time frame is not included, it is assumed that the action will occur sometime during the 10-15 year plan period. Timing will be partially based upon each site-specific situation.

**490. Public Concern: The Forest Service should ensure that any land exchanges are advantageous to the federal government.**

**Response:** Your concern is addressed in 36 CFR 254, Subpart A – Land Exchanges, and in FSH 5409.13, Chapter 30 – Land Exchanges.

**491. Public Concern: The Forest Service should use land acquisition to: 1) acquire coal lands adjacent to Pine Mountain, 2) add high-elevation acreage in the mixed mesophytic forest association, 3) protect cave habitats, protect or enhance bat habitat and populations of bat species, 4) acquire climbing areas located on private lands, and 5) fulfill objectives for species for which there is no suitable or restorable habitat on Forest land, but such habitat exists within the proclamation boundary.**

**Response:** Chapters 2 and 3 of the Plan, along with Forest Service handbooks and manuals, provide guidance for land acquisition.

**492. Public Concern: The Forest Service should specify how much land would be purchased, how it will be managed, and how these purchases would affect aquatic resources.**

**Response:** Chapters 2 and 3 of the Plan, along with Forest Service handbooks and manuals, provide guidance for land acquisition and how the lands will be managed. Congressional appropriations and the market value of land determine the acquisition program every year. Priorities are re-examined as land becomes available for acquisition.

**493. Public Concern: The Forest Service should purchase development rights from adjoining landowners.**

**Response:** Purchase of development rights on adjoining property has not been considered on the Daniel Boone National Forest. The need, to this point, has not arisen. The plan is silent on this possibility but does not eliminate this option.

**494. Public Concern: The Forest Service should suspend land exchanges.**

**Response:** Exchange of land is authorized by 36 CFR 254 Subpart A – Land Exchanges. Land exchanges have a valid purpose. This is explained in the EIS (Chapter 3, Land Adjustments and Uses, Effects Common to all Alternatives).

**495. Public Concern: The Forest Service should not exchange land with *[a specific company]*.**

**Response:** Specific land transactions are beyond the scope of this programmatic planning document. Comments are welcome for each proposed exchange project, however.

**496. Public Concern: The Forest Service should not sell public land.**

**Response:** Such a policy is out of the scope of a Forest plan. However, National Forest System lands are seldom sold, but they may be exchanged.

**497. Public Concern: The Forest Service should not allow easy transfer of land for uses that are not compatible with agency goals, management areas, prescription areas, and significant amendments.**

**Response:** Land exchanges provide a net improvement in the Forest's ability to achieve desired future conditions. Exchange for consolidation often offers the best possible means to attain these desired future conditions, given limited resources.

## COMMUNICATION SITES AND UTILITY CORRIDORS

**498. Public Concern: The Forest Service should revise Standard 5.C-LAND-1, as recommended, to restrict utilities and establish monitoring.**

**Response:** The wording has to remain as is because we cannot prevent recovery of reserved and outstanding mineral rights whereas we can mitigate the impact with protective measures.

**499. Public Concern: The Forest Service should purchase an inholding or other area within the forest any time a special use permit is issued for utilities or roads.**

**Response:** It is beyond the scope of this Forest programmatic plan. There is no legal authority to make this requirement.

**500. Public Concern: The Forest Service should implement new goals, objectives, and standards, as recommended, for the use of communication sites, utility corridors, water systems, maintenance of rights-of-way, and the collections of products and species.**

**Response:** The Plan, along with Forest Service handbooks and manuals provide guidance for special uses, and special product permits. See Forestwide Goals objectives and standards and lands standards under individual prescriptions areas. The process for review and approval of special uses is contained in 36 CFR 251, Subpart B - Special Uses and FSH 2709.11. Additional guidelines are in the 1900 manual. There is no need to repeat this in the Revised Forest Plan. Communication Towers can only be constructed on those sites designated in the prescription area as Communication Sites. To construct towers outside these sites will require a plan amendment.

**501. Public Concern: The Forest Service should require that transmission towers contain low intensity amber lights every 4 feet of height along the tower.**

**Response:** We believe that the Goals, Objectives and Standards are appropriate as stated in the Plan. Other specific measures will be implemented based on a site-specific project level analysis. Prescription Area 5A - Communication Sites, addresses migratory bird mortality and encourages implementation of mitigating measures.

**502. Public Concern: The Forest Service should examine alternatives that limit the construction of communication towers.**

**Response:** The Plan, along with Forest Service handbooks and manuals limit communication tower location.

**503. Public Concern: The Forest Service should ensure that access roads remain available for maintenance of transmission lines.**

**Response:** This is best dealt with on a site-specific basis in the individual permits. The issuance of new Special Use Permits will include access & maintenance provisions.

**504. Public Concern: The Forest Service should analyze and disclose the effects of power transmission lines and site-related electrical equipment. The Forest Service should analyze and disclose the effects of pipeline corridors, mitigation measures, and abandonment and removal of pipelines.**

**Response:** An interdisciplinary science-based analysis at the appropriate scale will be used to inform planners and decision makers of environmental effects at a site-specific analysis in the form of an EA/EIS that will be done for each special use proposal that becomes an application.

## Natural Resources Management

### NATURAL RESOURCES MANAGEMENT (GENERAL)

**505. Public Concern: The Forest Service should not allow timber harvest, mining, drilling, prescribed fires, herbicides and pesticides, off-highway vehicles, roads, pipelines, or other forest incursions.**

**Response:** The USDA Forest Service is mandated by Congress to manage the national forests for multiple uses. The national forests have a mission different from the national parks.

**506. Public Concern: The Forest Service should not conduct timber harvest and road building in cave watersheds. The proposed 200-foot buffer zone will not provide adequate protection.**

**Response:** A site-specific analysis will determine if harvesting and road building can occur without impacting the cave resource.

**507. Public Concern: The Forest Service should define differences between low, moderately low, and moderate impacts for all resources.**

**Response:** The Watershed Health Index is a relatively large-scale coarse filter developed to evaluate alternatives in forest plans and to establish priority work at the strategic planning scale. Therefore, further detailed analyses of the watershed will be conducted at the project level.

**508. Public Concern: The Forest Service should analyze the effects of timber harvest, mining, and development on surrounding private land.**

**Response:** Significant cumulative effects are addressed in the EIS under the resource affected.

**509. Public Concern: The Forest Service should identify what vegetation management practices will be conducted on specific vegetation types as required by 36 CFR 219.15.**

**Response:** This information is available in Appendix H of the Plan.

**510. Public Concern: The Forest Service should consider effects on all lands within the Forest's proclamation boundary when making conservation decisions.**

**Response:** Significant effects are addressed in the EIS under the resource or program affected. The analysis area is often contained within the proclamation boundary, but may vary by resource. The analysis areas are identified in the Environmental Effects section for each resource.

**511. Public Concern: The Forest Service should prosecute all staff that falsify information or knowingly aid in the distribution of false materials regarding timber cuts, habitat, etc.**

**Response:** This is beyond the scope of the plan. However, misconduct is taken seriously and will be dealt with according to established disciplinary processes.

## RESTORATION

**512. Public Concern: The Forest Service should conduct restoration.**

**Response:** Restoration is a part of the plan.

**513. Public Concern: The Forest Service should not conduct restoration at the expense of forest health.**

**Response:** Since these two concepts are complementary, there is no a conflict.

**514. Public Concern: The Forest Service should clearly define conditions that require timber harvest for restoration, and establish specific standards for restoration timber sales, as recommended.**

**Response:** To determine the purpose and need for each project, both Forestwide and prescription area desired future conditions (DFC) will be compared to a current condition. The environmental documentation for each project should explain how the project would help achieve the DFC. The Allowable Sale Quantity (ASQ) is a figure that must be disclosed as mandated by the National Forest Management Act to assure a non-declining flow of timber. The term “timber target” is not used in the Revised Forest Plan as a planning objective.

**515. Public Concern: The Forest Service should protect and restore large, interior blocks of native forest land.**

**Response:** The need for large blocks of interior forest land was considered when evaluating the needs of the species found on the Daniel Boone National Forest.

## **GUIDING MANAGEMENT PHILOSOPHY**

**516. Public Concern: The Forest Service should allow nature to take its course without human intervention.**

**Response:** One of the alternatives originally considered was alternative B, which matches your request. However it was rejected for various (including legal) reasons (see EIS, chapter 2, Alternatives considered but eliminated). A mostly hands-off approach was considered in greater detail in Alternative B-1. Please see the comparative analysis in the EIS.

**517. Public Concern: The Forest Service should focus management on environmental protection and ecotourism.**

**Response:** Plan prescriptions were designed to provide and protect habitat and connections among habitats for both common and rare species. Site-specific analysis can best address the elimination of invasive plant and animal species.

**518. Public Concern: The Forest Service should manage the forest for biodiversity, habitat and species conservation and restoration, scenic beauty, water, air, soil quality, and passive recreation.**

**Response:** We agree.

**519. Public Concern: The Forest Service should state that the goal of the Plan is to promote healthy and natural forest processes and growth.**

**Response:** We agree. That is the intent of the Forestwide goals.

**520. Public Concern: The Forest Service should manage the forest to be environmentally sustainable.**

**Response:** We believe the overall direction of the Revised Forest Plan will result in a diverse and sustainable forest, and provide long-term ecological, economic, and social benefits consistent with maintaining ecological health. The ecosystem management approach applied is fundamental to reaching these goals. In addition, the Plan provides the necessary flexibility required to address new findings and ensure application of the best available science.



**521. Public Concern: The Forest Service should state that the production of timber was and is a primary mission of the national forest system.**

**Response:** The mission of the national forests has evolved through the Organic Act of 1897, Multiple-use Sustained Yield Act of 1960, the regulations that implement the National Forest Management Act of 1976, and current Ecosystem Management policy. Although timber will be produced under the Revised Forest Plan, timber production will not be the primary purpose of the Daniel Boone National Forest during this planning period (Please see page 1-1 of the Plan.)

**522. Public Concern: The Forest Service should make ecosystem management a major priority. The Forest Service should use adaptive management and ecosystem management that focuses on outcomes.**

**Response:** The Revised Forest Plan is based on described desired future conditions projected to achieve landscape conditions that can sustain ecological processes and function. The focus of management actions is to obtain desired results, or outcomes, not produce outputs. Chapter 5 of the Plan discusses adaptive management.

## MONITORING AND EVALUATION

**523. Public Concern: The Forest Service should implement a systemized, regularly conducted monitoring program with information communicated to the public.**

**Response:** This is provided in Chapter 5 of the Plan, and monitoring task sheets. Monitoring results as well as other annual accomplishments are made available to the public through our year-end “Monitoring and Evaluation Report.”

**524. Public Concern: The Forest Service should have monitoring and field data peer-reviewed.**

**Response:** The desirability of having data collection and monitoring peer reviewed will depend on the scope of the project. Much of the monitoring activities on the Forest will occur cooperatively with other agencies and professional interests or in conjunction with efforts of the academic community.

## NON-TIMBER FOREST PRODUCTS

**525. Public Concern: The Forest Service should not issue permits for collecting in rare communities.**

**Response:** Please see Final EIS, Forest-wide direction and the Rare Community prescription for changes that address this concern.

## TIMBER RESOURCE MANAGEMENT (GENERAL)

**526. The Forest Service should manage the Daniel Boone National Forest to be a guiding light for high quality hardwood timber production in the region.**

**Response:** The Forest is concerned about quality hardwood production. Additional clarification concerning timber quality has been added under Goal 8. However where timber production for profit is typically the motive for private and industrial forest landowners, this is not a goal for the Daniel Boone’s Revised Forest Plan.

**527. Public Concern: The Forest Service should conduct timber harvest to benefit forest health, wildlife, and local economies.**

**Response:** We agree. Thank you for your support.

**528. Public Concern: The Forest Service should conduct more timber harvest to enhance recreation through additional access (open and gated roads).**

**Response:** When a system road is required for timber harvest, recreation access is one of many considerations during project planning and road design.

**529. Public Concern: The Forest Service should clearly define what is meant by harvesting timber and non-timber forest products on a sustainable basis.**

**Response:** The terms “timber products” and “non-timber forest product” are clearly defined in the glossary. We have also clearly defined the concepts of sustainability and sustained yield in the glossary. Determination of the sustainability of activities on lands outside of the national forest system is out of the scope of management of the Daniel Boone National Forest.

**530. Public Concern: The Forest Service should state in the Forestwide desired future conditions that timber harvest will be used as a management tool.**

**Response:** The Forestwide DFC in Chapter 2 of the Plan has been reworded as suggested.

**531. Public Concern: The Forest Service should allow the Forest to rest for many decades.**

**Response:** Forests never really rest – death, regeneration, and growth occur throughout the seasons of each year. We believe that we have planned a reasonable and needed amount of human disturbance.

**532. Public Concern: The Forest Service should develop a section within the Plan devoted to timber and timber management.**

**Response:** Appendix H of the Revised Forest Plan briefly describes science-based silvicultural systems, techniques, and methods that may be used on the Forest. A more detailed explanation of forestry practice is explained in greater detail in the many available texts and papers that have been published over the years. As indicated by the glossary definition, silviculture is applied in order to achieve the objectives of management. Objectives of forest management normally vary by ownership; therefore, there is not one particular way in which timber should be managed, or silviculture applied.

**533. Pubic Concern: The Forest Service should have research-based justification for removing land from the areas where timber harvest will occur.**

**Response:** One of the decisions a forest plan must make is the allocation of lands as “suitable” or “unsuitable” for timber production. We are not required to have lands solely designated for timber production. Most of the land-use allocations and desired future conditions were based on wildlife science and the science of ecology, although some land-use decisions are necessarily based on policy as well as current social interests. In the proposed Revised Forest Plan, we are considering timber harvest as a tool to achieve non-timber objectives.

**534. Public Concern: The Plan should clearly show where timber harvesting can and should be used as a tool, how it will be scheduled, the type of products that will be targeted and methods used.**

**Response:** The Revised Forest Plan has been changed to clearly show where timber harvesting may be used as a management tool (see Setting for each Prescription Area). Site-specific project analysis will determine where and how this tool will be used. An estimate of volume that might be produced by the timber program can be found in Appendix C of the Plan. No specific type of product is targeted in the Plan, since acres of various habitats provide a better “target” (or objective) within the preferred alternative. The desired future condition of the sale area along with market demand will influence the types of roundwood products that will be offered for sale at that time (Goal 8.1). Vegetation management methods (practices) available for use are disclosed in Appendix H of the Plan.

**535. Public Concern: The Forest Service should state that timber management is synonymous with vegetation management.**

**Response:** The terms “timber management” and “vegetation management” are not synonymous (Please see glossary definitions).

**536. Public Concern: The Forest Service should use timber harvest sparingly to improve habitat diversity.**

**Response:** Regardless of how “sparingly” is defined, our analysis indicates that the Plan prescribes an appropriate amount of timber harvest to achieve a balance of planned goals, including the improvement of habitat diversity.

**537. The Forest Service should limit logging to storm damaged trees and very limited timber harvests for research purposes only.**

**Response:** This was not an alternative considered. However, such an alternative would appear to be similar to Alternative B or B-1, which were not preferred for various reasons.

### **Suitable/Unsuitable for Timber Production**

**538. Public Concern: The Forest Service should present information regarding timber harvest in a reader-friendly fashion that does not mislead the public. The Forest Service should clearly define the terms “timber production” and “timber harvest,” and “suitable for timber production” as recommended.**

**Response:** We believe the terms “timber harvest” and “timber production” have been adequately defined in the Glossary of both the Plan and the EIS. However, clarification of the phrases related to suitability for timber production is made in the Setting section of all prescription areas and throughout the text, as well as in the Glossary.

**539. Public Concern: The Forest Service should increase the amount of land designated as suitable for timber harvest.**

**Response:** As indicated in Appendix H of the Plan, the array of habitat management (vegetation management) techniques will be available for use, regardless of suitability classification. However, the desired future condition (DFC) of a prescription area may narrow the need for many techniques. Where a prescription area is classified as unsuitable, the DFC indicates that there was no need for regularly scheduled timber harvest.

**540. Public Concern: The Forest Service should demonstrate the need to eliminate commercial timber harvest near significant bat caves and classify such lands as suitable with restrictions on harvest.**

**Response:** The cutting of trees, whether or not they are sold as timber products, can occur within this prescription area if the purpose and need for the action is based on habitat enhancement for associated proposed, endangered, threatened, and sensitive species.

**541. Public Concern: The Forest Service should specify that portions of riparian areas are suitable for timber harvest.**

**Response:** This Riparian Corridor Prescription Area was designed to address the needs of riparian-dependent species, as well as for soil, water, and aquatic species needs. The Coweeta and Fernow laboratory studies that you cite focused on water quality only, not riparian habitat. We concluded that a scheduled timber harvest is not needed to meet the desired future condition, except for a small amount of uneven-aged structure (1E-Objective-2.C.). There is very little upland portion in this prescription area, so different management of any narrow strips of transition along its borders would be impractical. There is provision in the Setting of the Riparian Corridor Prescription Area to vary the width of an area based on site-specific investigation.

**542. Public Concern: The Forest Service should not designate rare communities as unsuitable for timber harvest.**

**Response:** A scheduled harvest would not be necessary in these areas to achieve the desired future condition. However, occasional vegetation management may be necessary on a site-specific basis.

**543. Public Concern: The number of acres set aside as unsuitable for timber production will threaten forest health.**

**Response:** Forestwide Goal 2 gives reason for treatment in any stand that is not meeting the Glossary definition of forest health. Vegetation management may occur to help achieve the desired future condition in most prescription areas.

**544. Public Concern: The Forest Service should reduce the amount of land designated as suitable for timber harvest because of the presence of steep terrain and sensitive riparian areas and communities.**

**Response:** The Revised Forest Plan has several provisions for the management of steep terrain, sensitive riparian areas, and rare communities. The Daniel Boone National Forest, located mostly on the Cumberland Plateau, has different terrain than other national forests in the South (as well as other differences). Therefore, it has different management prescriptions and associated suitability classifications.

**545. Public Concern: The Forest Service should designate buffer zones and transitional zones around areas designated as unsuitable for timber harvest.**

**Response:** The locations of the boundaries for the prescription areas have been designed to promote and/or maintain the values (or desired future conditions) within each of the adjacent areas. Specific transition zone management would complicate implementation.

**546. Public Concern: The Forest Service should explain why the alternatives do not vary in the amount of land classified as suitable for timber production and provide information as requested.**

**Response:** There is a substantial difference in the alternatives in the amount of land classified as suitable for timber production, except between alternatives C, C-1, and D (see FEIS Ch.3 Timber Products). These alternatives vary in the amount of recreation emphasis, not significantly in timber production.

**547. Public Concern: What percentage of total regional forested land is made up of national forest timber-producing acres? What percentage of total forested land in the state do national forest system acres represent? This information is important for understanding the relative importance of these lands across the landscape.**

**Response:** This information is available in the FEIS (Chapter 2, Fragmentation) for the area within the Proclamation Boundary as well as for the Cumberland Plateau. A statewide analysis of forestland is out of the scope of this Plan but is available from the Forest Inventory and Analysis (FIA) at <http://srsfia2.fs.fed.us/>.

**548. Public Concern: How can ecological restoration in the preferred alternative lead to a sustainable supply of wood products? Once ecosystems have been restored, why is timbering necessary when it is only a byproduct of restoration activities?**

**Response:** The premise is for timber (managed on a sustainable basis) to be a by-product of the maintenance of “a variety of life” (Goal 1, Plan, Chapter 2). Maintenance of such variety begins with the maintenance of a variety of forest structure and composition, including the reduction of tree density (Objective 2.1.A), and may include restoration of conditions that once occurred (1K-Goal-2) which were once maintained by fire and grazing (FEIS, Chapter 3, Fire).

## FOREST STRUCTURE AND COMPOSITION

**549. Public Concern: The Forest Service should create a complex forest structure with an appropriate mix of complex canopy and understory structure for the Cerulean Warbler.**

**Response:** We have provided for cerulean warbler habitat not only through the mix of forest condition direction in the Plan, but also specifically Objective 1.1.B. found in Chapter 2 of the Plan.

**550. Public Concern: The Forest Service should provide a broad diversity of age class distributions to benefit forest health.**

**Response:** We have planned timber harvest in a large portion of the Forest to maintain forest health (see Goal 2) and a range of age classes will develop as a result of management for early succession (1K-Objective-1.A). A balanced broad diversity of age-classes would include those age-classes that tree species are capable of reaching. We believe the guidance in the proposed plan will achieve that diversity.

**551. Public Concern: The Forest Service should develop and maintain a mosaic of forest succession through more “suitable” land designations.**

**Response:** A mosaic of forest succession will be maintained on much of the forest, and we believe the balance between suitable and unsuitable timberland is reasonable based on the desired future conditions for each prescription area.

**552. Public Concern: The Forest Service should move toward an older forest condition, while managing for openings and early successional forest.**

**Response:** This is what is planned. Thank you for your support.

**553. Public Concern: The Forest Service should not manipulate species or replace hardwood forests with pine plantations, nor create pine plantations.**

**Response:** When tree species are planted outside of their natural range, the results are often failures; however, in general, pine planting in the southeastern United States has been a huge success. Both pine and hardwoods are viable on portions of Daniel Boone National Forest lands and have a 2,000 to 3,000 year history of being present (see EIS Viability Section). We intend to manage pine on some areas to provide an important habitat component for many rare species.

**554. Public Concern: The Forest Service should restore yellow-pine dominated forests.**

**Response:** We are planning to do this on some areas. Thank you for your support.

**555. Public Concern: The Forest Service should not plant yellow pine or scrub pine because the threat of beetles give them a poor chance of survival.**

**Response:** Pine restoration is planned for 822 acres per year (see Appendix C of the Plan). This slow recovery should result in a more balanced age-class distribution within the pine types than occurred in the past. In addition, a higher ratio of hardwood to pine is expected in stands planted to pine. Less dense stands are also planned (Objective 2.1.A). These factors should discourage the southern pine beetle. "Scrub pine" or Virginia pine will rarely (if ever) be planted except for mine reclamation.

**556. Public Concern: The Forest Service should replace cut trees with large healthy trees.**

**Response:** The desired condition is for large healthy trees to grow back where their predecessors once were.

**557. Public Concern: The Forest Service should replant harvested species with a similar number and type of species that was harvested, within one year.**

**Response:** Whether trees are planted following a harvest is determined by, among other things, the desired future condition for the area, the available advanced regeneration, and the physical conditions. Artificial regeneration in the next decade will be mostly pine restoration on sites formerly occupied by pine. We are required by National Forest Management Act to certify adequate regeneration within five years of harvest.

**558. Public Concern: The Forest Service should require replanting of new trees with equal in-growth and 1.5 times the economic value of those removed.**

**Response:** The majority of the regeneration that is planned will occur naturally. The small amount of planting (artificial regeneration) that is planned will be for pine ecosystem restoration, not economic value.

**559. Public Concern: The Forest Service should establish reasonable rotation ages for the different timber types to prevent the loss of red oak and pine.**

**Response:** The regeneration objective in the Habitat Diversity Emphasis Prescription Area has been clarified (see 1K-Objective-1.A). The objective indicates that rotations shorter than 200 years will probably be needed for stands in poor condition (excessive mortality, short-lived species, etc.)

**560. Public Concern: Long rotation ages are not appropriate because younger, more diversified stands survive disturbance events better than older stands.**

**Response:** Because the Forest contains more "older" stands than "younger" stands, one would expect to see more damage in older stands. We agree that the longer a stand exists, the more likely it is to suffer heavy damage from a stochastic event.

**561. Public Concern: The need for old-growth can be met by special areas.**

**Response:** Not a lot is known about old-growth forests in the east. Old-growth forests take long periods to develop – longer than the age of the oldest trees. Most old stands in the 1.K-Habitat Diversity Prescription Area will not have the desired old-growth characteristics within the rotations expected. We believe that the 1.I-Designated Old-growth Prescription Area is needed along with the “Special Areas” to develop an adequate range of old-growth types.

**562. Public Concern: The Forest Service should modify 1.K-Objective-1.A to specify that at least five percent of the area, excepting natural catastrophic events, will be maintained in a variety of vegetation.**

**Response:** Please note that this objective says “maintain five to six percent in each fifth level watershed.” Where watersheds already have well over six percent in the 0-10 age class due to natural catastrophic events, additional early succession would not be needed until the next decade. Some of these areas could be restored to pine-dominated forest types. While there may not be timber harvest (or salvage) associated with this work, there will be active forest management.

**563. Public Concern: The Forest Service should ensure accuracy in the number of acres and percentages reported for habitat composition and structure.**

**Response:** The acres of habitat reported have been clarified in the Plan. For the remaining area not specified by a percentage, there are no particular prescription area objectives.

**564. Public Concern: The Forest Service should specify details of timber management, as requested.**

**Response:** Management of mixed mesophytic forests will occur across the spectrum and not in any one variant of this forest type. White pine and hemlock tend to occur together. Xeric and mesic oaks tend to intergrade and can be difficult to separate. Key in this habitat was oak & fire. Identified niches or needs will be considered site specifically. Our viability analysis work identified mesic hardwood forests as important, but did not single out other types. Objective 1.3.A provides for acquisition of any high elevation forest. Mature forest habitat information is presented in the Vegetation Cover section of the EIS. The amount needed is in our process record and is available upon request. Canopy gaps are generally of the size created by 1-3 trees, but can be larger based on-site specific project analysis. Number is based on site-specific considerations. Differences between natural and created canopy gaps are determined by management response to natural gaps and management design of created gaps. See EIS for analysis. Open Mid-story and understory means few to very few midstory trees or shrubs, or in some cases no midstory trees and shrubs in at least part of the area. See EIS, Fragmentation section. See the Plan for standards and objectives related to snag size and number in areas in which vegetation management is planned. See the MIS section of the EIS and the Viability section of the EIS Appendix for information on species. (Taylor)

**565. Public Concern: The Forest Service should specify the age of hard mast producing stands.**

**Response:** This habitat element is defined as 50-150 year old oaks. Hickory and beech provide additional, although small, acreage.

**566. Public Concern: The Forest Service should more clearly specify herbaceous and shrub management.**

**Response:** Site-specific analysis will consider forest types, topographic locations as well as numerous other considerations to provide the most appropriate herbaceous and shrub species mix for the site.

**567. Public Concern: The Forest Service should explain the apparent discrepancy of analysis among alternatives for younger forest habitats.**

**Response:** The apparent discrepancy is the result of effects that differ by alternative. It is assumed for alternatives that one percent of the forest on average per year is affected by natural disturbance creating young forest habitat. Not all natural disturbance creates young forest habitat and not all disturbance is well distributed. In some instances, it is expected that natural disturbance will provide what is needed. In other instances it will not. This is a site-specific consideration.

**568. Public Concern: The Forest Service should clarify discrepancies in openings and early successional habitat.**

**Response:** Openings as used in the Demand Species section of the EIS refers to grassy opening, not early seral forest. The discussion of alternative B-1 in this section of the EIS has been clarified.

**569. Public Concern: The Forest Service should not create a patchwork of disturbance-maintained habitats because according to a Forest Service archeologist, the region used to be characterized by large tracts of mature interior forest.**

**Response:** Scientific evidence also exists that forests in this region were indeed influenced by disturbance that resulted in a patchwork of stem densities, crown covers, and species composition. Specific provisions for mature interior forest habitat have been made in the 1K-Prescription Area (1K-Objective-1C).

## MANAGEMENT PRESCRIPTIONS

**570. Public Concern: The Forest Service should not implement management prescriptions, unless restrictions are relaxed because restrictions will create forest health problems.**

**Response:** The restrictions (standards) that have been placed on certain activities are necessary for the maintenance of certain habitat elements, including water quality. Forest Health is a Forestwide goal.

**571. Public Concern: The Forest Service should specify that timber harvest is prohibited in prescription areas containing special and sensitive areas, as recommended.**

**Response:** Clarification for the term “unsuitable for timber production” has been incorporated in the setting information for each prescription area. This clarification identifies where timber harvest could occur. Standards (restrictions) provide for the protection of sensitive resources and additional restrictions may be added based upon a site-specific analysis.

**572. Public Concern: The Forest Service should integrate acreage amounts with the prescriptions areas and consider how diversity will be affected.**

**Response:** The acreage for each management prescription is displayed under the Setting heading of each prescription. The allocation of management prescriptions is also displayed in Table C - 3 of the Plan Appendix, and again for all alternatives in Tables 2 - 1 through 2 - 7 in the FEIS. Percentages may be calculated from these tables.

**573. Public Concern: The Forest Service should use appropriate stocking controls and release techniques to accomplish thinnings.**

**Response:** We are specifically planning on doing so (see 2.1-Objective-A). In addition, all silvicultural and vegetation “tools” are available for management of the Forest (see Plan, Appendix H).



**574. Public Concern: The Forest Service should not thin the Habitat Diversity Emphasis Area based on the Gingrich Stocking Chart because it is not appropriate for the forest ages indicated in the draft.**

**Response:** The Gingrich Stocking Chart is the best stocking guide now available. Until more information on the management of older stands becomes available, this chart will be graphically extended. The chart's recent use in a NEFES publication is referenced in the EIS (Timber Products, Effects, Alternative C, C-1, D). No definition for the term "operational age" was found in the Dictionary of Forestry. However, there seems to be a significant difference in the ages suggested as compared to typical mortality of species in our Old-growth Guidance. We assume "operational age" is an economic definition, and therefore may not relate well to the management objectives in the preferred alternative.

**575. Public Concern: Loss of overstory species will occur due to gypsy moth and other stressors such as global warming, unless shade intolerant and intermediate species are regenerated and maintained in a well stocked and vigorously growing condition.**

**Response:** We understand that stand mortality will increase beyond the culmination of periodic annual increment (CPAI), and that old trees are more likely to die than middle-aged trees, other factors being equal. Eventual loss of some overstory is necessary for development of vertical structure, which is part of the desired condition of the 1K-Habitat Diversity Emphasis Prescription Area. We have not seen research that would indicate that shade-tolerance correlates with gypsy moth risk. The effects of global warming are beyond the scope of this analysis.

**576. Public Concern: The Habitat Diversity Emphasis Area should have a maximum age of 120-140 years to maintain species composition and individual tree health.**

**Response:** Beyond potential effects of catastrophic events, we estimate that at age 150, the average upland stand will begin a decline in volume, since mortality will exceed growth (from Daniel Boone National Forest yield tables). Some individual trees will be "unhealthy," but the overall stand health (see glossary definition) may be acceptable. Regardless of stand age, oak and pine natural regeneration is expected where stand densities are low and fire and other site factors are favorable.

**577. Public Concern: The Forest Service should use techniques to manage for older age stands in the Habitat Diversity Emphasis Area, such as two-age systems.**

**Response:** We plan on doing so. Thank you for your support.

**578. Public Concern: The Forest Service should emphasize timber production; increase strategic planning and effectiveness; protect clifflines, riparian areas, and habitat; and manage the Habitat Diversity Emphasis Area in a manner that can be implemented by private forest owners.**

**Response:** Private timberland owners typically have economic management objectives different from those of the Daniel Boone National Forest. Private lands with different objectives are not managed with the same prescription as the national forest. However, we believe that the concept of desired future condition (DFC) could be emphasized on any property, regardless of ownership. The Plan seeks to promote timber harvest in most prescriptions as a management tool to achieve scientifically-based desired future conditions; harvest is not allowed in a few prescription areas including designated Wilderness. Timber production suitability classifications have been clarified.

**579. Public Concern: The Forest Service should specify a prescription for pine-oak timber production that is separate from biodiversity goals.**

**Response:** Pine restoration is treated differently between alternatives (EIS, Chapter 3, Timber Products, Resource Tables). Yellow-pine restoration is not an emphasis of Alternative E-1 (the timber production alternative), since yellow pine is not a high value or top value species (EIS, Appendix B).

**580. Public Concern: The Forest Service should not implement Habitat Diversity Areas or Forest Health/Biodiversity because it means more burning and logging.**

**Response:** As the EIS indicates, forest health, biodiversity, habitat diversity, and the production of timber products are important public values.

## **LATE SUCCESSIONAL/OLD-GROWTH**

**581. Public Concern: The Forest Service should conduct inventories of old-growth and develop acceptable plans, with explanation, for managing old-growth.**

**Response:** The purpose of the Preliminary Inventory of Possible Old-growth was to identify potential existing old-growth stands. About 12,000 acres of POG was mapped across the Forest (EIS, Chapter 3, Table 3 - 29). A discussion and analysis of the old-growth issue is provided in the EIS, Chapter 3, Affected Environment and Environmental Consequences. This preliminary examination of old age conditions was conducted to determine if any areas potentially qualify under the old-growth age criterion (Process Record - Preliminary Inventory of Possible Old-growth). No known and documented existing old-growth, meeting the criteria in Forestry Report R8-FR-62 (USFS 1997b), was found on the Forest as a result of this preliminary examination of existing data. An additional examination of these older stands is planned to determine if other old-growth characteristics exist.

**582. Public Concern: The Forest Service should protect, retain, and expand old-growth.**

**Response:** Most of the land on the Forest that is designated as unsuitable for timber production is managed to feature specific resource objectives, such as riparian habitat, or have special designations, such as wilderness, that will incidentally result in old-growth conditions. This is about half of the forest. An additional 25 percent of the forest will move into the 100-200 year age group as a result of implementation of the Habitat Diversity Emphasis Area. The management objective for functional old-growth (Forestwide Objective 1.4.B.) is to develop and maintain at least 8 percent of each old-growth type in areas at least 300 acres in size.

A large portion of Daniel Boone National Forest forest land is in the 70-100 year age group. Harvest and regeneration within this group will better distribute forest age structure. The Revised Forest Plan prescribes 5-6 percent early-aged forest, per 10-year period, within the Habitat Diversity Emphasis Area (378,770 acres). About half of this area will grow into the 100-200 year age group, about a quarter of the Forest. In addition, designated areas such as wilderness, wild/scenic rivers, and other special designated areas will grow into old age forest structure. Prescription areas featuring specific resource objectives, such as riparian, cliffline, source water, old-growth and rare communities will also add to old age forest conditions.

**583. Public Concern: The Forest Service should clearly define how decisions would be made to reclassify lands as old-growth.**

**Response:** Stands that currently meet the minimum old-growth age criterion have been identified and mapped as Possible Old-growth (POG). This identification was done to help determine the best locations for the Designated Old-growth Prescription Area. The currently identified POG stands represent about 12,000 total acres distributed across the Forest. An updated POG survey will be conducted for each project during the life of the Plan. The existing POG inventory will be updated during project planning. Each stand will be inspected for old-growth status. If identified as existing old-growth, a determination will then be made as to whether it will be retained as old-growth.

**584. Public Concern: The Forest Service should clearly define old-growth terms and use scientific analysis of ecosystem types and work with partners when establishing an old-growth network.**

**Response:** There was some misunderstanding of the old-growth terminology used in the draft documents. The EIS and Revised Forest Plan have been edited to better explain the various aspects of old-growth and how the concepts used in the planning process will guide management actions. The glossary of old-growth terms has also been edited for clarification. Specific criteria for identifying old-growth conditions for the Daniel Boone National Forest have been provided by the Regional Office (Forestry Report R8-FR-62, USFS 1997b).

**585. Public Concern: The Forest Service should refer to old-growth as mature forests.**

**Response:** We respectfully disagree. Old-growth is defined by a specific set of conditions for each forest type (Forestry Report R8-FR-62, USFS 1997b). “Mature forests” may, or may not, contain these conditions, and is therefore not synonymous with “old-growth forest”.

**586. Public Concern: The Forest Service should use the analysis of natural areas conducted by the Nature Conservancy and the Kentucky State Nature Preserves Commission for designating mature/old-growth habitat.**

**Response:** Our intent was to provide older forest mixed with younger forest and canopy breaks (not old-growth) within areas our bird survey data show to be heavily used by the cerulean warbler. We looked for these high cerulean use areas and found the three identified. Site-specific projects will develop the actual configuration and location of the areas.

At present, the Daniel Boone does not have documentation of any areas that meet all the old-growth criteria outlined in the regional guidance on old-growth. However, some areas may exist. The Designated Old-growth Prescription Area is detailed in Chapter 3 of the Revised Forest Plan.

**587. Public Concern: The Forest Service should designate old-growth stands where they can be managed and then strategically position old-growth stands adjacent to areas with developing old-growth, such as wilderness areas.**

**Response:** We agree. However, the selection of the Designated Old-growth Prescription areas was made in part to improve under-represented old-growth forest types. These nine areas encompass 15,300 acres with a strong representation of dry-mesic oak and mixed mesophytic hardwood (including American beech). Distribution and older age conditions were also primary considerations in the selection.

**588. Public Concern: The Forest Service should designate the White Oak and Sinking Creek areas as old-growth.**

**Response:** One Designated Old-growth area was selected in the White Oak watershed (see EIS, Chapter 3, Old-growth Effects Analysis, Table 3-31).

**589. Public Concern: The Forest Service should establish minimum size goals for old-growth areas and combine old-growth patches into one natural area.**

**Response:** As stated in the old-growth sections of both the Plan and EIS, we have set 300 acres as the minimum size for old-growth areas intended to support old-growth associated species, realizing that some level of natural disturbance will occur. Smaller areas may be designated for other purposes. The Designated Old-growth areas and most Future Old-growth areas exceed this area size (see EIS, Chapter 2, Old-growth Issue, Table 2 - 9 and Table 2 - 10). This provision is also included as a Forestwide Objective, 1.4.B.

**590. Public Concern: The Forest Service should provide comparative information on old-growth dependent species, old-growth habitat, remoteness, and forest interior habitats.**

**Response:** Chapter 3 of the EIS describes effects on Proposed, Endangered, Threatened, and Sensitive (PETS) species. The effects analysis on old-growth also can be found in the old-growth section of that chapter. As stated in the EIS (Chapter 2, Table 2-11) about 41 percent (271,688 acres) of forested land on the Daniel Boone National Forest is expected to develop into old-growth forest habitat, much of which will be functional in size. All old-growth forest types are represented within these areas. We believe that old-growth associated species will be well provided for within these areas and will persist over time on the Forest.

**591. Public Concern: The Forest Service should restore old-growth pine-oak woodland complexes and provide for the recovery of the red-cockaded woodpecker.**

**Response:** Restoration of the pine dominated woodland and forest communities is planned as part of the 1.K-Habitat Diversity Emphasis Prescription Area. Although it will take many decades (probably 50+ years) to begin development of suitable red-cockaded woodpecker habitat, it is a long-term consideration.

**592. Public Concern: The Forest Service should treat old-growth as wilderness.**

**Response:** Mature forest conditions will be sustained through both the Habitat Diversity Emphasis Prescription Area and old-growth provisions of the Revised Forest Plan.

**593. Public Concern: The Forest Service should not thin or burn old-growth.**

**Response:** Reference is to fire- and disturbance-maintained forest communities. Conditions can only be perpetuated on the Daniel Boone National Forest within the range of current capabilities.

**594. Public Concern: The Forest Service should specify that old-growth will not be subject to timber harvest.**

**Response:** Project-level decisions must follow the planning process (NEPA) and involve public review and participation. These small stand size areas are most likely not functional in supporting associated interior species or sustainable within the range of natural disturbance. However, they may be appropriate in addressing social or recreational interests and maybe retained based on a site-specific determination. Any vegetative manipulation within Designated Old-growth areas will occur only to improve and/or sustain the long-term perpetuation of the old-growth community.

**595. Public Concern: The Forest Service should prohibit salvage and sanitation activities in old-growth.**

**Response:** Since major disturbance events will affect the old-growth areas on the Forest, Standards 1.I-Veg-3 and 1.I-Veg-4 are important to facilitate old-growth recovery.

**596. Public Concern: The Forest Service should modify objectives and standards regarding old-growth, as recommended.**

**Response:** The Objectives and standards are appropriate as written.

**597. Public Concern: The Forest Service should analyze and disclose details of the effects of old-growth timber harvest.**

**Response:** This objective is provided to support development of old-growth conditions on very dry poor quality sites. Selective thinning may be necessary to achieve old-growth conditions and sustain forest composition due to limited nutrients and site capability.

**598. Public Concern: The Forest Service should manage old-growth forest for forest health.**

**Response:** Old-growth management will be applied to move toward the Desired Future Conditions identified for the Designated Old-growth Prescription Area, and to develop and sustain specific old-growth criteria as provided in Forestry Report R8-FR-62 (USFS 1997b). Early and mid-successional forest characteristics will not be favored, however tree fall gaps and multi-layered forest structure will tend to represent these structural attributes. Applied management will be specific to old-growth type as needed to sustain disturbance and fire mediated communities. The Plan calls for a 10-year order of entry which will systematically achieve inventory, treatment, and monitoring needs across the forest landscape on a 10 year cycle. Scheduling specific treatments and project site spatial relationships will be addressed at the project planning level.

Biological and ecological diversity across the landscape will be improved, adding to resilience of the forest ecosystem, although individual tree health may be reduced. Planned conditions are within the range of historic variability. Non-native invasive species will continue to be a significant threat to forest sustainability.

**599. Public Concern: The Forest Service should design old-growth to float across the landscape, with rotation age lengthened and allowable sale quantities increased.**

**Response:** Old-growth in many forest types is not a fundamentally even-aged structural condition. The multi-layered, gap regeneration character of mesic old-growth adds an element of diversity to the predominantly even-aged managed landscape of the Forest. It is not possible to lengthen rotation and increase the allowable sale quantity (ASQ) on the same land-base and still maintain a sustained yield. Both Possible Old-growth (POG) and Future Old-growth (FOG) are fixed areas based on a one-time analysis, and acreage considerations will not change over the life of the Revised Forest Plan. FOG does not apply to the Habitat Diversity Emphasis Area. Disturbance events were a primary consideration in providing for functional old-growth in the plan. Wilderness areas do contribute to FOG on the Forest.

**600. Public Concern: The Forest Service should acknowledge the conflict in Goal 1.8 with the number of acres of proposed old-growth.**

**Response:** Old-growth projected on the Daniel Boone National Forest will occur both through intent (Designated Old-growth Areas) and incidentally in low-level disturbance prescription areas (Future Old-growth). With the addition of the old-growth community, diversity across the landscape will be improved, adding to resilience of the forest ecosystem. However, individual tree health may be reduced. Planned conditions are within the range of historic variability. Non-native invasive species will continue to be a significant threat to forest sustainability.

**601. Public Concern: The Forest Service should not designate additional old-growth. The Forest Service should eliminate the Old-growth Prescription Area and reallocate acreage to the Habitat Diversity designation.**

**Response:** Old-growth is defined by specific criteria for each type in Forestry Report R8-FR-62 (USFS 1997b). The old-growth community is a natural part of the forest ecosystem containing structural characteristics that are not expected in an even-aged system of management. Both dry-mesic oak and mixed mesophytic hardwood (including American beech) were under-represented within Future Old-growth, as related to composition on the Forest.

## EARLY SUCCESSIONAL

**602. Public Concern: The Forest Service should increase early successional forest habitat to maintain flora and fauna and improve the status of imperiled species.**

**Response:** We believe the mix of habitats supported by Plan direction provides adequately, within the Forest's management capability, for species with moderate to very high likelihood of risk to viability.

**603. Public Concern: The Forest Service should increase early successional forest habitat to benefit wildlife, wildlife habitat, and hunting.**

**Response:** We believe the mix of habitats supported by Plan direction provides adequately for commonly hunted species and others found in early seral habitat, including birds. Specific management is included for grouse, but deer do not appear to be responding to early seral habitats (see MIS discussion in the Vegetation Cover section of the EIS). Woodlands and wooded grasslands/shrublands plus thinned forest will provide early seral elements usable by many species. We intend other management, such as burning and thinning, to provide for continued oak forest habitat on the Forest.

**604. Public Concern: The Forest Service should not create early successional habitat for deer.**

**Response:** We do not specifically create early seral habitat for deer. Deer use a variety of habitats, and it is expected that will take advantage of early seral habitat if present. Additionally, our recent review of MIS information indicates that deer do not respond to the amount of early seral habitat on the Forest (see MIS discussion in the Vegetation Cover section of the EIS and USDA Forest Service 2000).

**605. Public Concern: The Forest Service should analyze the effects of timber harvest on species requiring mature habitat.**

**Response:** The current early-age forest condition is skewed due to the recent, devastating impacts of the southern pine beetle. As provided in 1.K-Objective-1.A, the 0-10 year age class planned is 5-6 percent within the Habitat Diversity Emphasis Prescription Area. MIS should reflect the change in forest age structure by the end of the 10-15 year planning period as well as long-term. Analysis of the fragmentation issue is provided in Chapter 3 of the EIS.

**606. Public Concern: The Forest Service should determine the amount of early successional habitat that was present in the pre-European landscape.**

**Response:** We have evidence that habitat with elements attributable to early seral habitat existed on the Forest (see Viability section of the EIS). Much of this would not have been in the form of a clearcut or low basal area shelterwood, but rather in the form of woodland as well as open, repeatedly burned forest or the mosaic of tangled structures associated with storm events. In association with the national effort to determine fire condition classes on the landscape, we will be addressing the question of amounts of contributing habitat on the landscape. The adaptive management approach we are taking will allow us to make adjustments as needed.

**607. Public Concern: The Forest Service should conduct analysis and disclose data on the effects of creating early successional habitat.**

**Response:** We believe the direction presented in the Plan, particularly in the Habitat Diversity Emphasis Prescription Area, shows how this habitat type will be maintained. Other than the discussion of Old-growth (significant issue), which includes many considerations other than biological ones, early seral habitats were discussed as much as later seral habitats. The Rare Communities Prescription Area addresses the fact that many of these are indeed disturbance-dependent communities. The Plan direction presented provides for early seral habitat elements in many forms, e.g., areas of 0-10 year old forest, grassland, wooded grassland/shrubland, woodland, and open, burned forest.

To a large degree, prescribed management in the Plan is based on local existing bird survey and inventory data, the Northern Cumberland Plateau Bird Conservation Plan (Partners-in-Flight), and coordination with the USFWS – Division of Migratory Birds. Planned diversity in forest composition and age structure will provide and sustain the diverse assemblage of avian species of the Daniel Boone National Forest.

**608. Public Concern: The Forest Service should conduct analysis and disclose data on the effects of creating early successional habitat to include activities on private land and regionally.**

**Response:** Ecosystem management, on which the Plan is based, requires landscape scale considerations and analysis. However, the National Forest Management Act requires that forest species be provided for within the planning unit (national forest ownership) to the extent practicable [CFR 219.19 and 219.27(g)], not within the proclamation or physiographic boundary. We used recent satellite data that indicated a slight increase in forest acres within the proclamation boundary (see Forest Fragmentation section in EIS). We acknowledge that over the entire Cumberland Plateau this is not the case (see Fragmentation Section of EIS), but this is not the analysis area considered (see Forest Fragmentation section of EIS). Please see the Vegetation Cover and Fragmentation sections of the EIS for analysis.

## THE ROLE OF NATURAL DISTURBANCE

**609. Public Concern: The Forest Service should rely on natural disturbance as a tool for creating habitat diversity.**

**Response:** The Plan provides for a variety of habitats to meet viability and other regulations. The Plan considers natural disturbances in determining habitat needs and includes disturbance conditions in computations. (Please see 1.K-Objective-1.) In addition, all projects are subject to site-specific analysis. If habitat elements created by natural disturbance provide the desired future condition, there is no reason to create additional areas of that habitat. Where natural disturbance alters important habitat elements, work may be prescribed to modify the condition.

**610. Public Concern: The Forest Service should analyze and disclose the amount of early successional habitat created by natural disturbances. The Forest Service should acknowledge the role of insects, disease, and wildfire as natural disturbances in creating habitat diversity.**

**Response:** We have indicated in the EIS that we expect about one percent of Forest habitat per decade to resemble what is usually called early successional (similar to a clearcut or shelterwood cut). Additional storm damaged areas are expected to occur, but will not have habitat similar to early successional conditions.

## COMMERCIAL TIMBER HARVEST

**611. Public Concern: The Forest Service should limit logging to storm damaged trees and very limited timber harvests for research purposes only.**

**Response:** Such an alternative appears to be similar to alternatives B or B-1, which are not preferred for various reasons including forest health and species viability considerations. In addition, the Forest Service has several Experimental Forests dedicated for forest research in our region. The Southern Forest Research Station determines the location and need for these areas.

**612. Public Concern: The plan should contain provisions for a timely workable disaster response, because the lack of a plan has resulted in waste from the 2003 ice storm.**

**Response:** Planning for salvage operations must be done on a project-level basis.

**613. The Forest Service should allow commercial timber harvest, especially in riparian areas.**

**Response:** Although harvesting will be reduced in riparian areas, the Plan does not eliminate timber harvest from these areas. Harvesting may occur when it moves the area toward a desired future condition.

**614. Public Concern: The Forest Service should reduce commercial timber harvest and redirect funding into forest restoration, which will also create jobs.**

**Response:** Timber harvesting is one of many tools that will be used to restore and maintain a diversity of desired ecosystem conditions, including a certain amount of early-successional habitat. The harvest of woods that are in an undesirable condition, to allow regeneration and development of more desirable woods, is a part of that restoration.

**615. Public Concern: The Forest Service should not allow commercial timber harvest.**

**Response:** We respectfully disagree. The cutting of trees to create various patterns of openings and the development of varying structure in the Forest has been determined to benefit the diversity of life on the Daniel Boone National Forest (EIS, Chapter 3, Biological Elements). Such trees can be cut and left for wildlife purposes (e.g. 1K-Objective-1M), or cut and used by society. The former option will generally cost the taxpayer more than the latter, thus the need for the option of commercial harvest.

**616. Public Concern: The Forest Service should develop and adopt an alternative that eliminates commercial timber harvest.**

**Response:** We considered such an alternative but determined that it did not warrant further evaluation for several reasons (see EIS, Chapter 2, Alternatives Considered but Eliminated).

**617. Public Concern: Based upon a Kentucky statewide opinion poll The Forest Service should have included cessation of commercial timber harvest in each alternative.**

**Response:** The question used in the referenced poll leads the respondents to a predictable response. Polls are typically less reliable than most scientific sampling techniques. Many polls, surveys, and other sampling techniques were considered during the planning process.



## Environmental Considerations in Timber Program

**618. Public Concern: The Forest Service should conduct silvicultural applications and vegetation management within riparian areas.**

**Response:** We agree. We plan on doing necessary vegetative management activities to achieve the desired future condition within the riparian prescription area.

**619. Public Concern: The plan will lead to long-term degradation of timber quality on the Daniel Boone National Forest, leading to loss of forest and the decline of ecosystem health.**

**Response:** We know of no research that indicates that the average 190 year-old stand is of less value than the average 100 year-old stand. Our upland hardwood volume tables indicate that as stand volume declines beyond age 150, average diameter at breast height (dbh) continues to increase. Quality generally increases with average stand diameter. Since there is little information available on the growth and yield of older stands, the analysis of the management situation (AMS) done each decade should lead to adjustments in the Plan, if a decline in timber quality becomes evident.

**620. Public Concern: An increasing acreage of overstocked conditions for all forest types runs counter to the President's Healthy Forest Initiative.**

**Response:** We are planning active forest management on all lands classified as suitable for timber production. We also have the option of correcting overstocked conditions on a significant portion of the forest classified as unsuitable, since thinning may occur where needed to meet the desired future condition (see Forestwide Objective 2.1.A).

**621. Public Concern: The Forest Service should give special consideration when planning timber sales in riparian areas, clifflines, and cave areas.**

**Response:** The Plan provides for such consideration.

**622. Public Concern: The Forest Service should not allow timber harvest because it has detrimental effects on the environment.**

**Response:** The Environmental Impact Statement explains that the preferred alternative has a positive overall effect on the viability and diversity of wildlife, songbirds and native plants, while having a limited impact on other factors of the environment.

**623. Public Concern: The Forest Service should not allow timber harvest because timber harvest increases the risk of fire.**

**Response:** Tree cutting activities (e.g. harvest, non-commercial thinning, or site preparation) can temporarily increase the ignition and severity potential for fire within the disturbed areas, when weather and moisture conditions are within certain ranges. These factors are used to advantage as many of these areas, in fact, could be burned during reforestation treatment. In eastern forests this is an expected localized condition, and the chance (or risk) of spread beyond the treated stands is minimal.

**624. Public Concern: The Forest Service should prohibit timber harvest within 300 feet of threatened and endangered and sensitive species.**

**Response:** Several forestwide, programmatic prohibitions have been established in the Revised Forest Plan concerning many management activities, including timber harvest, as they relate to proposed, endangered, threatened, and sensitive species. These are minimum distances. Second level, site-specific analysis will determine whether or not additional restrictions of management activities are needed.

**625. Public Concern: The Forest Service should modify Standard 5.C-VEG-1 by restricting timber harvest within 300 feet of a perennial stream.**

**Response:** The standard has been modified along with 5.C-Objective-2.A.

**626. Public Concern: The Forest Service should modify Standard 5.C-VEG-1 for Zone 1, as recommended, and prohibit timber harvest in all three zones.**

**Response:** In Standard 5.C-VEG-1, a sentence has been added after “Zone 1” for clarification. Your other comments were considered but we believe the standards as written are appropriate.

**627. Public Concern: The Forest Service should prohibit timber harvest in areas with slopes greater than 45 percent, to prevent harm to thin and erodible soils.**

**Response:** Many of these areas within the 1K-Prescription Area are classified as unsuitable for timber production due to economic reasons (Plan, Appendix C, Timberland Suitability Classification). However, in some situations on steep slopes where timber harvest is needed, cable yarding systems can be used with little soil impact to achieve the desired condition. Several Forestwide vegetation standards are intended to prevent soil loss.

**628. Public Concern: There should be no need for timber harvest to improve habitat on the Morehead Ranger District in the area affected by the 2003 ice storm.**

**Response:** This is a site-specific concern, out of the scope of a programmatic Plan. Such catastrophic events will require a project level analysis to determine if any action is needed to help move the area toward the desired future condition specified in the Plan.

**629. Public Concern: The Forest Service should monitor timber harvest sites to ensure that after-effects of timber sales comply with the Plan.**

**Response:** The implementation, effectiveness, and validation monitoring we have planned is disclosed in the Plan (see Chapter 5 and Appendix D).

**630. Public Concern: The Forest Service should analyze and document the effects of timber harvest on soil productivity, arthropods, and fungi.**

**Response:** Where soils are properly managed, timber harvest operations can protect and enhance soil properties and qualities.

**631. Public Concern: The Forest Service should specify details for skid routes as well as analyze and provide the details of skid trail effects on soils and vegetation.**

**Response:** Chapters 2 and 3 of the Plan, along with the Forest Service Manual and handbooks, provide for the protection of soils. Additional protections will be recommended, as needed, at the project level based upon the characteristics of the sites the projects will impact. We believe that the level of analysis needed at the strategic (Revised Forest Plan) level has been achieved.

**632. Public Concern: The Forest Service should specify how soil compaction by tractors and skidders will be addressed.**

**Response:** Chapters 2 and 3 of the Plan, along with the Forest Service Manual and handbooks, provide for the protection of soils. Additional protections will be recommended, if needed, at the project level based upon the characteristics of the sites the projects will impact.

**633. Public Concern: The Forest Service should better analyze the effects of timber harvest on slope stability.**

**Response:** Chapters 2 and 3 of the Plan, along with the Forest Service Manual and handbooks, provide for the protection of soils. Additional protections will be recommended, if needed, at the project level based upon the characteristics of the sites the projects will impact. We believe that the level of analysis needed at the strategic (Revised Forest Plan) level has been achieved.

**634. Public Concern: The Forest Service should analyze timber harvest on private land for its effects on the Daniel Boone National Forest.**

**Response:** Forest Inventory and Analysis (FIA) information was considered in the Timber Supply and Demand Economic Report which may be viewed at the following website location:

<http://www.southernregion.fs.fed.us/boone/planning/documents.htm>.

**635. Public Concern: The Forest Service should analyze the effects of the timber program for each alternative.**

**Response:** The headings of the EIS fall under two major categories: “Environmental Factors” and “Resource Programs.” Within each of the Environmental Factors, the author had the option of discussing the effects of each resource program on that factor or sub-part of that factor or discussing the combined effect. Each author presented his or her section in the most appropriate fashion.

## **Socioeconomic Considerations in Timber Program**

**636. Public Concern: The Forest Service should target added-value timber products.**

**Response:** Forestwide Goal 16 generally addresses this concern, although there are no specific objectives. A variety of species and log sizes will be made available now and in the future as primary forest products. However, the Forest Service generally has had little influence on the development of secondary forest products markets and business.

**637. Public Concern: The Forest Service should specify guidance on thinning to promote harvest of high-value saw timber and veneer.**

**Response:** An objective has been added to Forestwide Goal 8 to provide direction for leave tree selection.

**638. Public Concern: The Forest Service should conduct ecosystem-based community forestry that benefits the community and prohibits sale of timber to corporations whose profits leave the community or who have violated environmental laws or worker rights.**

**Response:** The Revised Forest Plan provides for forest management practices that are beneficial to local communities in a variety of ways. Individual national forests do not have the authority to impose constraints on export of logs from national forest timber sales or on the eligibility of timber sale bidders based on infractions not associated with national forest timber sales.

**639. Public Concern: The Forest Service should not be concerned with “below cost sales;” costs should not be what drive forest management.**

**Response:** There are no profit or other financial goals in the Plan. Responsible financial management is of overall management and Plan implementation.

**640. Public Concern: The Forest Service should not provide additional timber to harvesters as a gift for conducting salvage harvests.**

**Response:** Timber sales occur as a result of implementation of the Revised Forest Plan. All sales, including salvage, are conducted openly and occur only when a reasonable and fair market price is paid for the timber or a service equal in value is returned to the Forest.

**641. Public Concern: The Forest Service should disclose data regarding timber production as a percentage of that harvested in Kentucky and the region.**

**Response:** This information has no bearing on the selection of an alternative or the selection of timber harvesting as a tool to obtain a desired future condition.

**642. Public Concern: The Forest Service should analyze local needs for wood processing facilities and the effects of Daniel Boone National Forest timber on local markets and pricing.**

**Response:** Analyzing the local needs for wood-processing facilities is outside the scope of the Revised Forest Plan. The significant economic effects to the local economy are disclosed in the Socioeconomic section of the FEIS.

**643. Public Concern: The Forest Service should disclose full costs of the timber sales program.**

**Response:** Budget levels for each alternative are displayed in Appendix B of the FEIS.

**644. Public Concern: The Forest Service should not subsidize timber harvest, roads for timber harvest, or replanting.**

**Response:** Direction for financial management is outside the scope of the Revised Forest Plan. However, as part of Plan implementation, the Forest Service pays a fair market price for all contracts. No subsidies occur.

## Allowable Sale Quantity

**645. Public Concern: The Forest Service should increase the allowable sale quantity (ASQ) to maintain forest health.**

**Response:** The resulting condition of the forest and amount of acres harvested has more to do with a healthy forest, than the amount of timber harvested. We believe that forest health will be maintained as a result of the planned activities of the preferred alternative.

**646. Public Concern: The Forest Service should adjust the allowable sale quantity to provide for a rotation age of 120 years that maintains oak-dominated species.**

**Response:** The loss of an oak component in stands is due to inadequate oak regeneration, not a loss of oak due to excessive stand age (see EIS Chapter 3, Forest Health, Prescribed Fire). A greater oak component will result with increased prescribed burning and thinning. If excessive mortality occurs in older oak stands, regeneration may be needed. Clarification has been made in 1.K-Objective-1.A to explain that shorter effective rotations may occur where needed.

**647. Public Concern: The Forest Service should reduce the allowable sale quantity (ASQ), because the current timber harvest within Kentucky is unsustainable.**

**Response:** The ASQ set for each alternative is sustainable, based on our analysis (EIS Chapter 3, Timber Products, Effect of the Long Term Sustained Yield Goal). The Forest Service has no authority to regulate timber harvest from private lands.

**648. Public Concern: For economical and other practical reasons, the Forest Service should not reduce the allowable sale quantity.**

**Response:** Economic perspective differs from one interest to another. Alternatives E and E-1 that generally emphasized timber production and other economic concerns were considered (EIS Chapter 2, Alternatives) but not selected.

## Harvest Methods

**649. Public Concern: The Forest Service should modify Standard 1.E-VEG-1, as recommended, to allow the use of cable timber harvest methods within riparian areas.**

**Response:** Standard 1E-VEG -1 has been modified as needed. The desired future condition for roads within the Riparian Prescription Area is described in the text, and standards are displayed under the Roads/Engineering heading (Plan, Chapter 3, 1.E-Riparian Corridor).

**650. Public Concern: The Forest Service should modify Standard 1.E-VEG-1, as recommended, to prohibit the use of cable timber harvest, and other vegetation manipulation within riparian areas, to prevent sediment from washing into stream/riparian areas.**

**Response:** Some vegetation manipulation will be necessary to achieve the desired future condition within the Riparian Corridor Prescription Area. Control of sediment levels is a major consideration within this prescription area and is integrated into the design of the desired future condition as well as within the standards (Plan, Chapter 3). Cable logging has been shown to cause less environmental impact on steep slopes than tractor skidding (EIS Chapter 3, Soil and Water).

**651. Public Concern: The Forest Service should modify language in cliffline vegetation management standards to allow the use of heavy equipment and timber harvest.**

**Response:** Standard 1C-VEG-2 has been modified.

**652. Public Concern: The Forest Service should create young forest across 8-10 percent of riparian areas in 5-10 acre blocks with stem densities of 6,000+ per acre.**

**Response:** Vegetative manipulation is planned in the Riparian Corridor Prescription Area to stimulate shrub development within 2 to 4 percent of the area. Half of this open canopy structure will be maintained using uneven-aged regeneration methods (1.E-Objective-2.C) and the other half using permanent shrub/sapling openings (1.E-Objective-2.B). In addition 1 to 2 percent of the riparian area will be maintained in canebrakes, and canopy gaps will occur randomly as a result of natural disturbance. We believe that this riparian disturbance habitat will adequately provide for the viability of ruffed grouse, woodcock, and other riparian associated species.

**653. Public Concern: The Forest Service should increase the maximum size of cuts for early successional habitat within riparian areas to 5-10 acres.**

**Response:** Most of the riparian corridor is unsuitable for timber production, with only 2,151 acres are classified as suitable. Uneven-aged management does not track the spatial distribution of openings. Instead, treatments are based on tree diameter distribution to achieve and sustain an identified growth curve. This silvicultural system was selected for limited application in the riparian corridor to provide a shrub component without introducing potentially adverse effects of edge created by larger openings.

**654. Public Concern: The Forest Service should create early successional forest using clearcuts.**

**Response:** Clearcut harvest and stand regeneration methods are available for management applications across the forest. These may be applied as appropriate through site-specific determination.

**655. Public Concern: The Forest Service should conduct controlled clearcut timber harvest.**

**Response:** Early-aged forest habitat will be provided primarily within the Habitat Diversity Emphasis Prescription Area, which includes over half of the forest, distributed across the landscape. Clearcut harvest and stand regeneration methods are available for application as appropriate to achieve desired future conditions and will be determined through a site specific examination.

**656. Public Concern: The Forest Service should not conduct clearcut or other even-aged timber harvest methods the Forest Service should specify standards that limit the use of clearcuts to restoration.**

**Response:** The clearcut method is specifically prescribed only in the Ruffed Grouse Emphasis Prescription Area. The method of harvest will be determined on a site-specific basis. The specific technique needed to attain a desired future condition will determine the technique employed.

**657. Public Concern: The Forest Service should use selective (uneven-aged) timber harvest methods.**

**Response:** Selection method is specifically to maintain a small amount of uneven-aged forest in the Riparian Prescription Area (1.E-Objective-2.C). The method may also be useful in other prescription areas, as determined on a site-specific basis.

**658. Public Concern: The Forest Service should require cut-to-length (CTL) logging equipment (forwarders) to prevent erosion and compaction.**

**Response:** The need for limitations on logging equipment is determined on a site-specific basis. The slope and soils are elements in that analysis.

**659. Public Concern: The Forest Service should use two-age shelterwood timber harvest that retains snag and den trees.**

**Response:** Two-age shelterwood timber harvest that retains snag and den trees will be used whenever it will help achieve desired future conditions.

**660. Public Concern: To prevent soil erosion, the Forest Service should not conduct shelterwood timber harvest.**

**Response:** Timber harvesting (regardless of method) can be done with minimal soil movement and sedimentation. As the EIS explains, “with successful revegetation of bare soil area, erosion and sedimentation rates should diminish rapidly to pre-disturbance levels within three years. The greatest decrease (occurring) in the first two growing seasons.”

**661. Public Concern: The Forest Service should conduct timber harvest using small operators with portable saws, since mounds of sawdust and piles of slabs make good wildlife habitat.**

**Response:** Such operations are not precluded by the Revised Forest Plan and could be prescribed based upon site-specific analysis.

**662. Public Concern: The Forest Service should not have seed production areas, which could result in a loss of genetic diversity.**

**Response:** Tree seed production areas scattered throughout the southern region support the Forest Service's genetic tree improvement research that has been operating in the region for many years. Issues involved with this program are beyond the scope of this Plan. More information concerning this program can be found by beginning a search at <http://ntsl.fs.fed.us/>

**663. Public Concern: The Forest Service should use proven mid-story and understory control treatments as well as fire as an experimental treatment.**

**Response:** It has been shown in the EIS that tree regeneration (especially oak and yellow-pine), tree density, and habitat goals will likely depend on the reintroduction of fire. The plan contains provisions to closely monitor the effects of fire on these factors (Plan, Appendix D). We expect continuing and new research to develop around the fire program (Plan, Appendix E).

**664. Public Concern: The Forest Service should specify standards for timber harvest that benefit wildlife species.**

**Response:** Provisions for the retention and development of snags to benefit wildlife are contained in Forestwide Standards DB-WLF-2 and DB-WLF-14. The 1.K-Habitat Diversity Prescription Area contains provisions to benefit wildlife (1.K-Objective-1.N and Standard 1.K-VEG-1). Downed woody material is provided for in the 1.K-Habitat Diversity Emphasis Area (1.K-Objective-1.M) and the Ruffed Grouse Emphasis Area (Standard 3.H.1-WLF-1).

**665. Public Concern: The Forest Service should modify standards regarding timber harvest and vegetation, as recommended.**

**Response:** DB-VEG-2; there might be situations where we need these tools, as determined on a site-specific basis. DB-VEG-6; it can be assumed that ephemeral streams are included in this standard. DB-VEG-22; temporary openings are just that – they are temporary. Although a shelterwood with reserves and wooded grassland may be similar in appearance for a short period, regeneration is encouraged under the shelterwood, not in the adjacent wooded grassland. DB-VEG-23; CFR 219.27(d)(2) limits the size of even-aged openings. The USDA Forest Service Region 8 standard for the minimum distance separating even-aged regeneration areas (330') is in the Daniel Boone National Forest's 1985 Forest Plan. DB-Veg-24; only one cut is normally needed for the regeneration of two-aged stands.

**666. Public Concern: The Forest Service should clarify DB-WLF-2.**

**Response:** This standard has been reworded for clarification.

**667. Public Concern: The Forest Service should seed skid trails and log landings to provide vegetative cover.**

**Response:** Re-vegetation of skid trails and log landings is provided for in the Plan under Forestwide Standard DB-ENG-4. It is also addressed in Forestwide Guideline Engineering-5 and Ruffed Grouse Emphasis Area Guideline 3.H.1-VEG-5.

**668. Public Concern: The Forest Service should modify Standard 1E-VEG-3. Any timber cut should be salvaged to recover costs as well for the control and suppression of insects and disease.**

**Response:** The wording in standard 1E-Veg-3 was developed to ensure incorporation of large woody debris into aquatic systems. However, the standard is worded to allow other options if needed.

**669. Public Concern: The Forest Service should conduct detailed analysis that compares the effects of timber harvest methods on proposed, endangered, threatened, and sensitive species.**

**Response:** The DEIS provides a programmatic comparison of effects of all alternatives to proposed, endangered, threatened, and sensitive species (pp. 3-187 to 2-195). The Biological Assessment, dated November 6, 2003, provides individual species analysis for the preferred alternative (C-1). The Biological Opinion for the Revised Forest Plan has not, as yet, been written by the USFWS. Under the Revised Forest Plan shelterwood trees are generally retained in the stand until the next rotation. The new Plan also contains specific prescription areas specifically delineated to provide habitat benefits to a large number of proposed, endangered, threatened, and sensitive species.

## Thinning and Stand Improvement

**670. Public Concern: The Forest Service should increase allocations for timber stand improvement to 10,000 acres per year.**

**Response:** The Revised Forest Plan is not restrictive in the amount of acres that could be thinned or have stand improvement, rather the Plan provides for those activities to occur. When considering the environmental effects, as documented in the environmental impact statement, a figure was derived based on current and predicted budgets.

**671. Public Concern: The Forest Service should specify objectives for thinning in the marking guidelines.**

**Response:** Goal 8.3 was added to emphasize the priority of achieving habitat objectives and then the improvement of stand survivability and potential timber value.

**672. Public Concern: The Forest Service should analyze and disclose the purposes and effects of various thinning practices. Alternatives such as thinning by means of prescribed fire or allowing the forest to self-thin should also be analyzed.**

**Response:** The Revised Forest Plan provides for creating certain conditions across the landscape. To accomplish these objectives, a variety of techniques would likely be considered during project development. The environmental effects of various thinning techniques are best considered during site-specific project planning. Some thinning is likely to be the result of burning, some the result of cutting down trees, and some the result of self-thinning. Removal and marketing of trees is also likely to occur and is an appropriate activity on National Forest System lands.



## RECYCLING AND ALTERNATIVES TO FOREST PRODUCTS

**673. Public Concern:** The Forest Service should promote the use of natural products for building construction and road construction. The Forest Service should promote recycling of wood products and ways to reduce waste. The Forest Service should promote sustainable energy such as solar and wind power as alternatives to coal and natural gas.

**Response:** The Forest Service promotes the efficient use and recycling of wood products and the use of solar and wind power when appropriate. The Research and the State and Private Forestry branches of the Forest Service generally lead these programs. Additional information can be found at [http://www.fs.fed.us/na/morgantown/eap/fpcr/fpcr\\_pub.htm](http://www.fs.fed.us/na/morgantown/eap/fpcr/fpcr_pub.htm)

**674. Public Concern:** The Forest Service should encourage the use of agricultural fiber and other alternatives for wood and paper fiber by not producing subsidized timber products.

**Response:** Encouraging markets for agricultural fiber is beyond the scope of the mission of the Forest Service; however, other agencies within the USDA may encourage such use. As land stewards (and consumers), we have a choice between maintaining diverse forest habitat in conjunction with the production of renewable wood fiber, or clearing forest land for agricultural fiber production.

## FOREST HEALTH MANAGEMENT (GENERAL)

**675. Public Concern:** The Forest Service should state that forest health is a desired future condition.

**Response:** While the term “forest health” does not specifically appear in the discussion of the Forest in the short-term and in the long-term (Plan, pp. 2-2 through 2-4), essential elements for providing a healthy forest are present. The term “forest health” by itself does not describe the condition(s) that equate to a healthy forest. Implementation of the desired future condition descriptions, goals, objectives, and standards together should result in a healthy forest. The awareness that forest health is an issue was disclosed as a significant issue in the DEIS beginning on page 3-122.

**676. Public Concern:** The Forest Service should better define “forest health.” The Forest Service should use a wider ecological concept of forest health beyond silvicultural and use-oriented values. The Forest Service should not use the term “forest health” because there is no widely accepted definition for this concept.

**Response:** Any single definition for “forest health” has been and will continue to be debated. The scientific, political, and social communities all have different views of a healthy forest. The Revised Forest Plan defines forest health in its glossary (Appendix, p. A-12). The DEIS repeats the same definition on page 6-12. Further clarification of forest health was provided in the DEIS beginning on page 3-122. Simply pointing out “unhealthy” conditions may not lead to an acceptable or complete definition of forest health. Conditions may be unhealthy from one perspective but beneficial from another. Our goal is to provide a diversity of conditions.

**677. Public Concern: The Forest Service should analyze and disclose the effects of numerous variables on forest health.**

**Response:** The analysis described in the DEIS was intended to identify some representative indicators for use in assessing forest health, realizing that many other indicators also exist. The selected indicators were used to evaluate the current condition against changed conditions as a result of implementing management direction that moves toward desired conditions. Many of the suggested indicators would result in using similar vegetative conditions, such as tree age, stocking, species composition, etc., as was used with the chosen indicators. There is no indication that the results of the analysis would differ from those already disclosed.

**678. Public Concern: The Forest Service should develop plans and broader language to deal with alien species in general and refer to federal guidelines. The Forest Service should not identify the management of non-native species as a Forestwide goal.**

**Response:** The terms “alien” and “non-native invasive” species are similar terms that could be used interchangeably. For the purposes of this action, the term non-native invasive species was used. Some species such as trout may not be native to the area but are desirable to anglers. Other species, such as honeybees, occur in the area, but are not native. Goal 2.4 of the Revised Forest Plan is to reduce risk from native and non-native invasive species through integrated pest management strategies. Goal 2.3 of the Revised Forest Plan is to reduce outbreak populations of invasive species or eradicate isolated infestations of invasive species and prevent their becoming established. Integrated pest management (IPM) is defined in the glossary. This general direction provides the latitude to propose strategies that can be tailored to individual situations. No single strategy would likely apply to all invasive species. Latitude is provided for resource specialists to consider and use state-of-the-art technology and strategies that can be adapted to site-specific situations.

## Insect and Disease Management

**679. Public Concern: The Forest Service should manage insects that attack timber.**

**Response:** Insect management is not an exact science. While specific treatment methods are available, their use on a large landscape scale, with few exceptions, is usually cost prohibitive. Because of the broken land ownership patterns it is difficult if not impossible to determine the cause and source (public, private, or combination of land ownership) of insect infestations. The most effective and efficient method to manage insects is through integrated pest management strategies that include manipulating vegetation condition, eradication of small populations, and combinations of control methods depending on the insect in question. The Revised Forest Plan provides for consideration of most any IPM strategy. Limitations come in the form of funding and resources to combat these insects.

**680. Public Concern: The Forest Service should focus on the hemlock wooly adelgid.**

**Response:** Currently, there is no known method to control or suppress the hemlock wooly adelgid. It is appropriate for research needs to be identified in the Revised Forest Plan. Research of this nature is conducted by the Forest Service, but not at the local national forest level.

**681. Public Concern: The Forest Service should not manage insects that attack timber.**

**Response:** The Revised Forest Plan includes descriptions of desired conditions. Timber is a resource as well as a by-product of creating these desired conditions. The Revised Forest Plan provides for managing insect activity that could impact desired conditions and, in turn, impact timber quality.

**682. Public Concern: The Forest Service should acknowledge that the southern pine beetle will be less of a threat in the future.**

**Response:** All insect populations are cyclic. Some insect populations peak every year, while others peak every 2 to 4 years. Still others peak at longer intervals. Southern pine beetle infestations are common throughout the south on a 5 to 7 year interval. In Kentucky, southern pine beetle infestations have occurred on a much longer interval of 15 to 25 years. At a state or Forestwide scale, southern pine beetle infestations may not play a large role over the next 15 to 25 years. However, southern pine beetle are always present in the ecosystem and may become a local concern to individual stands of pine trees.

**683. Public Concern: The Forest Service should have entomologists or pathologists disseminate information to landowners concerning forest insect infestations.**

**Response:** The State and Private Forestry branch of the Forest Service provides support services to state and private landowners. Numerous publications are available and are continually updated as new science becomes available. Additional information can be found at [http://www.fs.fed.us/foresthealth/briefs/invasive\\_species\\_mgmt\\_strategy.htm](http://www.fs.fed.us/foresthealth/briefs/invasive_species_mgmt_strategy.htm)

**684. Public Concern: The Forest Service should conduct forest thinning to prevent the spread of insects and disease from the Daniel Boone National Forest to nearby private property.**

**Response:** Thinning is described in the environmental impact statement as a likely action over the planning period. The amount of thinning to be done will depend on such variables as funding and other resources needed for implementation. Insects and disease are always present in the ecosystem regardless of landownership (public or private). There is no basis to assume that action or inaction on public lands would lead to devastating effects on private land. Action or inaction on private land plays a large role on the spread of insects and disease. While actions on private land cannot be accurately predicted, they are likely to be influenced by economic factors.

## Invasive Non-Native Species

**685. Public Concern: The Forest Service should control invasive and non-native species. The Forest Service should specify the prevention, control, and eradication of non-native species as an objective with standards, then develop and implement prevention strategies as recommended.**

**Response:** Forestwide Goal 1 provides for maintaining a variety of life as well as the recovery of native and desirable non-native populations that are rare and declining. As defined in the glossary, an invasive species is one that can move into an area and become dominant, either numerically or in terms of cover, resource use, or other ecological impacts. Eradication of invasive species is a Forestwide goal (Goal 2.3). While the Revised Forest Plan provides general direction and limitations to project implementation, action strategies are best developed at the project level.

**686. Public Concern: The Forest Service should inventory and monitor invasive species, analyze the effects of management activities, and analyze effects of invasive species on ecological processes.**

**Response:** The Revised Forest Plan (see Chapter 5 and Appendix F) provides for monitoring as well as adjustment of management activities in the light of monitoring results. Results will be in the annual monitoring and evaluation report.

**687. Public Concern: The Forest Service should eliminate the use of genetically modified organisms.**

**Response:** Goal 1 of the Revised Forest Plan provides for maintaining a variety of life and the recovery of native and desirable non-native populations that are rare and declining. The Revised Forest Plan does not specifically address genetically modified organisms, either natural or human induced.

**688. Public Concern: The Forest Service should develop standards that exclude the use of invasive species to vegetate roadsides and mineral development.**

**Response:** Objective 2.3.B provides for managing isolated occurrences of invasive species to avoid outbreak conditions. Proposals to use invasive species would be inconsistent with this objective.

**PESTICIDES, HERBICIDES, AND INSECTICIDES****689. Public Concern: The Forest Service should use herbicides to eradicate non-native invasive plants.**

**Response:** The Revised Forest Plan provides for such activity to occur.

**690. Public Concern: The Forest Service should acknowledge that management for butternut at the exclusion of fescue will require herbicides.**

**Response:** This is a scientific fact that is more appropriately disclosed in scientific literature and evaluated at the time such action is proposed.

**691. Public Concern: The Forest Service should provide analysis and scientific rationale supporting buffer widths for herbicide application.**

**Response:** A buffer zone is provided as a margin of safety in the event of chemical drift or accidental spill during broadcast treatment. Herbicides that are commonly used for broadcast treatment are not labeled for use over standing water, but could be used much closer than the 30-foot buffer. This standard is a carry over from the 1985 Forest Plan and was not identified as an item that needed to be changed during the Analysis of the Management Situation.

**692. Public Concern: The Forest Service should not use herbicides and pesticides. The Forest Service should find biological alternatives to using pesticides and herbicides. The Forest Service should modify vegetation standards regarding herbicides as recommended.**

**Response:** Revised Forest Plan direction provides for the use of many tools to accomplish resource management objectives. Not to consider the use of herbicides would arbitrarily eliminate a tool from the resource specialist's possible management practices. Site-specific consideration is a more appropriate place to address the use of herbicides. When a project proposal includes the use of herbicides, a non-herbicide alternative is considered, thus providing a comparison of the tradeoffs of the two or more actions.

**693. Public Concern: The Forest Service should analyze, consider, and disclose the effects of using insecticides, herbicides, and pesticides.**

**Response:** This type of analysis is more appropriate at the site-specific level when herbicide use is proposed. The term "pesticides" is inclusive of insecticides and herbicides.

**694. Public Concern: The Forest Service should require right-of-way holders to use mechanical means rather than chemicals for maintenance.**

**Response:** This type of determination is more appropriate during site-specific consideration of a proposed action.

**695. Public Concern: The Forest Service should revise and implement standards for herbicides as recommended.**

**Response:** Many standards that appeared in the 1985 Forest Plan, via the 1989 VMEIS, were redundant with existing laws or Forest Service policy, which require following direction on labels. The Revised Forest Plan does not repeat direction that is already required.

## Fire Management

### WILDLAND FIRE (GENERAL)

**696. Public Concern: The Forest Service should educate citizens regarding fire and provide adequate enforcement.**

**Response:** This will occur as much as financing and resources permit.

**697. Public Concern: The Forest Service should acknowledge the role of natural succession, fire, and its effects.**

**Response:** Please see the Prescribed Fire section of EIS Chapter 3.

### PRESCRIBED FIRE

**698. Public Concern: The Forest Service should conduct timber harvest and use prescribed fires.**

**Response:** Timber harvest and prescribed fire will be used when necessary to obtain the desired future condition of the Forest.

**699. Public Concern: The Forest Service should reduce the use of prescribed fire. The Forest Service should use prescribed fire for the purpose of research. The Forest Service should not implement large-scale prescribed fires without conducting scientific analysis. The Forest Service should analyze and address the effects of prescribed fire on reptiles, amphibians, birds, and smoke-sensitive rare species such as the Indiana bat.**

**Response:** Prescribed fire will be used when it will assist in obtaining the desired future condition of the area. Research may use these burns to improve our knowledge of their effects. Prescribed burning, like all projects on the Daniel Boone National Forest, must undergo second-level, site-specific analysis for effects to proposed, endangered, threatened, and sensitive species and other resources. Many plant and wildlife species on the Forest can benefit from the appropriate application of prescribed fire. The viability of plants and animals will be considered in the decision to burn. Effects of actions involving federally listed species are reviewed by the USFWS as required by the Endangered Species Act.

**700. Public Concern: The Forest Service should prohibit the ignition of prescribed fires with chemical agents in rare communities.**

**Response:** Site-specific analysis will determine what the appropriate ignition method is for a given location.

**701. Public Concern: The Forest Service should educate the public on the use of fire as a management tool.**

**Response:** This will be done as financing and resources permit.

**702. Public Concern: The Forest Service should modify 1.G-FIRE-WET-1.**

**Response:** We believe the standard is appropriate as stated.

**703. Public Concern: The Forest Service should allow fires to move into glades from other areas instead of igniting fires within glades.**

**Response:** Management actions including the use of prescribed fire for areas adjacent to rare communities will be determined by site-specific analysis.

**704. Public Concern: The Forest Service should restrict the use of fire to single tree or small group selection in scattered spots of pine stands. Such fires should be confined by ground crews.**

**Response:** We respectfully disagree. Recent studies no longer support this previous view.

**705. Public Concern: The Forest Service should not use helicopters for igniting prescribed fires.**

**Response:** Helicopter ignition with the use of plastic sphere dispensers has proven to be safe, cost efficient, and effective.

**706. Public Concern: The Forest Service should not use prescribed fires where private land or homes might be affected.**

**Response:** Proximity to private land and homes is taken into consideration and planned for in any site-specific burn plan.

**707. Public Concern: The Forest Service should not conduct prescribed fires because of air pollution.**

**Response:** The Plan addresses these concerns in Goal 4.2, Objective 4.2a , b, and c; and in Forestwide Standard DB-FIRE 3. The EIS has been edited to emphasize that the air quality analysis for the prescribed fire program is a regional analysis and does not represent actual emission increases in any one locality (see Air Quality, Environmental Effects of Prescribed Fire).

**708. Public Concern: The prescribed fire standard DB-FIRE-8 should apply only to *known* Indiana bat roosting areas.**

**Response:** The word “known” has been added, as suggested.

**709. Public Concern: The Forest Service should not use prescribed fire on slopes.**

**Response:** The potential for soil movement off site is considered before deciding whether to burn an area.

**710. Public Concern: The Forest Service should re-examine whether all chemical, fire, manual, and mechanical methods are realistically available for use in the forest. The Forest Service should not use prescribed fire, but instead, use chemical treatments to suppress competition in understories. The Forest Service should specify to what degree fire would be used to generate oak and the effects of fire on biodiversity. The Forest Service should not use heavy equipment to construct fire-containment rings, nor fire and insecticides.**

**Response:** Appropriate site preparation and restoration methods will be evaluated based upon the intended results and the site on which the action will occur. The specific characteristics of the site will determine what equipment and techniques will be used to achieve the appropriate results.

**711. Public Concern: The Forest Service should not apply Western fire policies to Eastern forests.**

**Response:** Fire played an important role in shaping the species-rich landscape of the southeastern U.S. Fires of both natural and cultural origin were common on the landscape when the present arborescent flora migrated into the region after the last ice age, 8,000 to 10,000 years ago. The LMP provides direction for the desired future condition of ecosystems. In many cases, fire is necessary to meet those objectives.

**712. Public Concern: The Forest Service should expend funds for controlled burns in the West where it is needed, not in the East.**

**Response:** Currently, only about 12 percent on the national fuel reduction dollars are allocated to the Southeast Region of the Forest Service.

**713. Public Concern: The Forest Service should use native or non-invasive species to stabilize fire control lines.**

**Response:** Forest Service, Region 8, policy does not allow the use of species that have been determined to be invasive within the Region.

**714. Public Concern: The Forest Service should modify fire management standards, as recommended.**

**Response:** Changes were considered and made where appropriate.

## Mineral Resources

### FEDERAL AND PRIVATE MINERAL RIGHTS

**715. Public Concern: The Forest Service should not allow the development of mineral (coal, etc.) resources. The Forest Service should not issue or renew any mineral leases.**

**Response:** Through the passage of the 1920 Mineral Leasing Act, Congress established a program to provide for oil, gas, and coal development on federal lands, including those national forests reserved from the public domain. The Mineral Leasing Act for Acquired Lands of 1947 extends the provisions of the mineral leasing laws to acquired National Forest System lands and requires the consent of the Secretary of Agriculture prior to leasing. The purpose of this Act is “to promote the mining of coal, phosphate, sodium, potassium, oil, oil shale, gas, and sulphur on lands acquired by the United States.” The Daniel Boone National Forest strives to achieve the goals outlined in these laws, while practicing sound environmental reviews to protect the environment.

**716. Public Concern: The Forest Service should specify that land subject to mineral and energy activities will be returned to “its pre-disturbance land use.” The Forest Service should clearly specify that it will have input and direct control over how owners of private mineral rights are allowed to reclaim disturbed federal lands.**

**Response:** Our relationship with private mineral operators is based on state laws. For reserved rights there are the USDA Secretary’s Rules and Regulations that were made a part of the deed when the property was acquired. Outstanding mineral rights are also based on the deed of severance that separated the mineral estate from the surface estate. Ownership of private minerals is a right and not a privilege. Owners of private minerals have the right of access to those minerals. The Daniel Boone National Forest works with the mineral holder to create a Plan of Operations that strives to meet the objectives of both parties.

**717. Public Concern: The Forest Service should specify mineral development standards that protect ecosystems.**

**Response:** Each prescription area has a standard for mineral extraction, which offers protection for the environment while allowing appropriate opportunities for mineral development. Compared to the 1985 Forest Plan, standards in the Revised Forest Plan include more provisions that take into account the various surface resources, including ecosystems, on the National Forest.

**718. Public Concern: The Forest Service should not locate mineral development activities where they will negatively impact geologic resources with identified values. The Forest Service should prohibit mining near rare communities.**

**Response:** Management guidance in this area is clear under Forestwide Standards DB-MIN-2 and DB-MIN-3 and Rare Community prescription area Standards 1.G-MIN-1 and 1.G-MIN-2.

**719. Public Concern: The Forest Service should specify standards for mineral development that protects riparian areas, cliffhines, rare communities, and old-growth, and make the areas administratively unavailable or specify no-surface occupancy. The Forest Service should prohibit mineral activities within wild and scenic rivers, the Red River Gorge, and the Natural Arch Scenic Area by classifying them as Not Administratively Available. The Forest Service should modify 1.C-MIN-1 to prohibit mining within cliffline communities. The Forest Service should prohibit mining near rare communities.**

**Response:** The Wild corridors of the Wild and Scenic Rivers, and the two Wildernesses are withdrawn from federal mineral entry by law. The other areas mentioned have standards that adequately protect surface resources, while allowing mineral development. The Minerals section in Chapter 3 of the FEIS identifies federal mineral availability and associated stipulations.

**720. Public Concern: The Forest Service should analyze an alternative that limits the negative effects of mineral development.**

**Response:** Alternative B-1 includes the most limited opportunities for minerals development. See Chapter 2 of the FEIS.



**721. Public Concern: The Forest Service should analyze, consider, and disclose the full details and effects associated with mineral development.**

**Response:** The Reasonably Foreseeable Development (RFD) in the FEIS discloses the most likely activity during the planning period. These figures are used in other areas of the FEIS, such as the soil and water, air resources, etc., to determine the effects of this projected activity. The Surface Mining Control and Reclamation Act of 1977 does not authorize surface mining of national forest lands east of the 100<sup>th</sup> meridian. Therefore, coal-mining effects will be limited to the effects of underground mining. The coal mining potential for the area has been documented in the FEIS.

**722. Public Concern: The Forest Service should ensure that no toxic chemicals affect the surface or contaminate bodies of water during mineral development activities.**

**Response:** Activities related to oil and gas drilling are conducted within the parameters of a State permit. In developing an Operations Plan for oil and gas development, the project level is where adjustments are made to protect water resources from impacts such as sedimentation and contamination. Earthen pits are accepted by the State of Kentucky for natural gas productions, while tanks are used in the development of oil resources.

**723. Public Concern: The Forest Service should specify that all lands will be restored to a natural state once the mineral activity is completed, and disclose analysis of restoration methods.**

**Response:** Reclamation plans are required for oil and gas operations on the Daniel Boone National Forest. The reclamation will include seeding of the disturbed area with native and non-invasive plant species.

**724. Public Concern: The Forest Service should document each permittee's past reclamation performance.**

**Response:** Permittees on minerals projects work with a designated Forest Service representative that oversees the project from the beginning of implementation through to reclamation. Should a problem arise, it is documented and addressed.

**725. Public Concern: The Forest Service should require proof of bonding for reclamation.**

**Response:** All permittees under the state permitting process have a blanket bond for their operations within Kentucky, and an individual bond for wells. These are to insure proper plugging and abandonment of wells. The individual well bonds are to accompany the well permit when it is submitted.

**726. Public Concern: The Forest Service should restore private inholdings and areas adjacent to the forest that affect resources on the forest.**

**Response:** The Daniel Boone National Forest is not authorized to use allocated funds directly on private lands. Partnerships with other interested parties may be a useful tool in pooling resources to remedy environmental problems that occur on national forest land and private land.

**727. Public Concern: The Forest Service should specify in DB-MIN-1 that all appropriate state and Federal permits are required prior to conducting surface-disturbing activities.**

**Response:** A change has been made to DB-MIN-1, as suggested.

**728. Public Concern: The Forest Service should develop an alternative that does not include the leasing of Federal mineral rights.**

**Response:** Alternative B-1 has very minimal opportunities for Federal mineral development. The existing laws that govern leasing of federal minerals make it clear that we are to include minerals activities within the management of the national forest lands where it is possible to integrate them into forest management.

**729. Public Concern: The Forest Service should prohibit mining where mineral rights are publicly held because of economic and environmental issues.**

**Response:** The existing laws that govern leasing of federal minerals make it clear that we are to include minerals activities within the management of the national forest lands where it is possible to integrate them into forest management.

**730. Public Concern: The Forest Service should purchase private mineral rights under publicly owned forest land.**

**Response:** Consolidation of the surface and subsurface estate on National Forest System lands is addressed under Goal 13. In addition, Objective 13.2.B identifies those prescription areas where the mineral estate is one of the priority areas to be acquired. Areas not listed in this objective do have standards and stipulations that provide some conditions for the development of minerals.

**731. Public Concern: The Forest Service should acknowledge that the Tennessee Valley Authority (TVA) no longer owns coal underlying the Redbird Ranger District.**

**Response:** The respective table has been edited for clarification.

**732. Public Concern: The Forest Service should implement restrictions on private mineral right holders.**

**Response:** In the administration of private mineral rights, the exercise of those rights is not a privilege but a right owned by a private party. As such, the Forest Service has no role in leasing, and the BLM is not involved in approval of an Application for Permit to Drill (APD) or a Lease by Application (LBA) for coal. Since there is no lease or permit, there is no contractual agreement to be met. The Daniel Boone National Forest negotiates with the owner or operator of the private mineral rights to address environmental concerns at the project level.

**733. Public Concern: The Forest Service should modify Table 3-16 to depict lands currently under lease.**

**Response:** This information has been added to the Minerals section in Chapter 3 of the FEIS.

## **SURFACE OCCUPANCY**

**734. Public Concern: The Forest Service should specify a no-surface occupancy stipulation for rare communities.**

**Response:** The Rare Community prescription area encompasses many types of features that are on the National Forest. The controlled surface use stipulation highlights the area(s) of concern (depending on the type of rare community identified, when leasing occurs, and the project level analysis will be used to determine the potential for undesirable effects to any rare communities in the project area. The analysis will also be used to determine if standards in the Revised Forest Plan are sufficient or whether additional mitigation measures are called for.

**735. Public Concern: The Forest Service should specify a No Surface Occupancy stipulation and not include the Controlled Surface Use stipulation for riparian corridors.**

**Response:** Standard 1E-MIN-1 has been edited for clarification. Federal oil and gas leases will contain either a No Surface Occupancy or Controlled Surface Use stipulation, depending on site-specific analysis. The site-specific analysis will determine if the conditions at the site will allow for limited surface occupancy in the riparian corridor. This arrangement will allow leasing of oil and gas only when it can be done in a way that is consistent with the desired future condition of the Riparian Corridor prescription area.

**736. Public Concern: The Forest Service should specify a no-surface occupancy stipulation for Zone 2 in 5C-MIN-1.**

**Response:** The Source Water Protection prescription area is entirely based on Kentucky Division of Water (DOW) Source Water Areas and the standards were developed with their input. This standard was written in an effort to be consistent with State DOW direction. This can be modified during future site-specific analysis.

**737. Public Concern: The Forest Service should modify DB-MIN-3 to specify no surface occupancy within drainage areas associated with karst systems, as recommended.**

**Response:** This standard was designed to provide adequate protection of these features in most cases. Further protection may occur as a result of site-specific analysis. Additional direction for karst mapping and management is given in Objective 3.0.B, and the objectives under Goal 6, one of which is to develop additional specific management plans for each significant cave.

**738. Public Concern: The Forest Service should disclose what it can do to restrict activities under existing and future leases, and conditions.**

**Response:** The Revised Plan addresses new concerns about forest resources and provides protection for those resources. The stipulations and the standards applied in the Revised Forest Plan place more restrictions on the leasing of federal minerals than the 1985 Forest Plan. The Minerals section in Chapter 3 of the FEIS has been rewritten to better explain these stipulations.

**739. Public Concern: The Forest Service should clarify controlled-surface use language to specify that facilities will be limited to one percent of an old-growth stand in 1.I-MIN-1.**

**Response:** The intent of this old-growth stipulation is that manipulation of the surface in old-growth areas be limited to 1 percent of each individual old-growth area to be affected, not 1 percent of the entire prescription area. This includes nine discrete areas averaging approximately 1,700 acres each. The words "each individual" have been added to the standard.

**740. Public Concern: The Forest Service should prohibit mining under old-growth.**

**Response:** Consolidation of the surface and subsurface estate on National Forest System lands is addressed in the Revised Forest Plan under Goal 13. In addition, Objective 13.2.B identifies those prescription areas where the mineral estate is one of the priority areas to be acquired. A decision on prohibiting mining in these areas will be addressed in project level analysis.

**741. Public Concern: The Forest Service should not allow surface occupancy for minerals in the Clifty Wilderness Area and Beaver Creek Wilderness Area.**

**Response:** These areas are statutorily withdrawn for mineral entry by law.

## MINES

**742. Public Concern: The Forest Service should develop a standard that addresses subsidence.**

**Response:** The Daniel Boone National Forest requires that all proposals adhere to State standards and requirements for all minerals projects. The Forest Service then adds additional mitigations to address our concerns, including subsidence concerns. The Daniel Boone National Forest works within the site-specific analysis along with the state permitting process to identify concerns such as surface subsidence.

**743. Public Concern: The Forest Service should require a vertical buffer zone of at least 200 feet for mining and require that 50 percent of the coal seam remain in place.**

**Response:** What the commenter suggests is one of several possible site-specific mitigation measures that may be required. The mining methods, geology of the area, percent of coal removed and other factors affect the potential for subsidence, which we will continue to review during the project-level analysis conducted for each proposal.

**744. Public Concern: The Forest Service should analyze and address the cumulative underground hydrological effects of mining.**

**Response:** Broad, programmatic-level cumulative effects are discussed in the Minerals section in Chapter 3 of the FEIS. However, the mining methods, geology of the area, percent of coal removed, and other factors determine the specific effects of each project. Specific cumulative effects will be determined and disclosed in each project's environmental documentation.

**745. Public Concern: The Forest Service should not allow mountaintop removal.**

**Response:** The Surface Mining Control and Reclamation Act of 1977 states that surface mining is permitted in National Forest areas west of the 100<sup>th</sup> meridian. Therefore, the Daniel Boone National Forest is not threatened by surface mining impacts from new development.

**746. Public Concern: The Forest Service should correct plan inconsistencies regarding coal production and leasing, and cite consultation with the Bureau of Land Management (BLM).**

**Response:** The "Coal Production/Consumption in Kentucky" graph has been corrected (FEIS, Chapter 3, Minerals). The BLM is now listed under "Other Agency Consultants" (FEIS, Chapter 5).

**747. Public Concern: The Forest Service should not allow mining in special areas.**

**Response:** Through the passage of the 1920 Mineral Leasing Act, Congress established a program to provide for oil, gas, and coal development on federal lands, including the national forests reserved from the public domain. The Mineral Leasing Act for Acquired Lands of 1947 extends the provisions of the mineral leasing laws to acquired National Forest System lands and requires the consent of the Secretary of Agriculture prior to leasing. The purpose of this Act is "to promote the mining of coal, phosphate, sodium, potassium, oil, oil shale, gas, and sulphur on lands acquired by the United States." The Daniel Boone National Forest strives to achieve the goals outlined in these laws, while practicing sound environmental reviews to protect the environment.

**748. Public Concern: The Forest Service should require an EIS for Leslie Resources, Inc. to analyze the effects for both Tract 107Ab and Tract 745.**

**Response:** This site-specific concern is outside of the scope of this Revised Forest Plan and EIS. The purpose of this EIS is to analyze the potential effect of the programmatic goals, objectives, and standards for the Daniel Boone National Forest.

## **MINE RUNOFF, LEACHATE, AND TAILINGS AND MINE RECLAMATION AND RESTORATION**

**749. Public Concern: The Forest Service should specify plans to reclaim and remediate mineral development sites.**

**Response:** Goals 9 and 10 of the Revised Forest Plan address this concern. The Daniel Boone National Forest is currently completing an inventory of abandoned mine sites in order to prioritize the impacts to the environment and prepare to take appropriate actions to acquire funding for remediation projects.

**750. Public Concern: The Forest Service should inventory old leaching mine sites, specify the number and location of such sites, and conduct site clean-up and restoration. The Forest Service should establish the reclamation of old mines and leach and glob piles as a high priority. The Forest Service should inventory abandoned and inactive mines and conduct enforcement to effect remedial investigation and corrective action.**

**Response:** The Daniel Boone National Forest is currently completing an inventory abandoned mine sites in order to prioritize the impacts to the environment and prepare to take appropriate actions for remediation of the sites.

**751. Public Concern: The Forest Service should only permit surface-disturbing activities that will be reclaimed to forest and fish and wildlife habitat.**

**Response:** In most cases we recommend that forest is the selected option for a post mining land use for activities that are within or in close proximity to the National Forest.

## **LEASABLE (OIL, GAS, COAL, PIPELINES)**

**752. Public Concern: The Forest Service should not allow the withdrawal of gas or oil from forest land.**

**Response:** Through the passage of the 1920 Mineral Leasing Act, Congress established a program to provide for oil, gas, and coal development on federal lands, including those national forests reserved from the public domain. The Mineral Leasing Act for Acquired Lands of 1947 extends the provisions of the mineral leasing laws to acquired National Forest System lands and requires the consent of the Secretary of Agriculture prior to leasing. The purpose of this Act is “to promote the mining of coal, phosphate, sodium, potassium, oil, oil shale, gas, and sulphur on lands acquired by the United States.” The Daniel Boone National Forest strives to achieve the goals outlined in these laws, while practicing sound environmental reviews to protect the environment.

**753. Public Concern: The Forest Service should update standards, prescriptions, and conditions for oil and gas special use permits and authorizations, as recommended.**

**Response:** The Daniel Boone National Forest follows guidelines that have some new conditions for oil and gas operations. These guidelines were developed from experience in working with these projects and input from Forest Service regional specialists.

**754. Public Concern: The Forest Service should analyze and disclose the effects of hazardous material spills, and develop contingency plans. The Forest Service should analyze, consider, and disclose full details and effects associated with oil and gas development.**

**Response:** The FEIS provides information on significant effects of oil and gas development at the programmatic scale. Additional information has been added in Chapter 3 of the FEIS. More detailed effects are disclosed at the site-specific level based upon the specific activity and characteristics of the site.

## Alternative Energy Products

**755. Public Concern: The Forest Service should invest money in renewable energy instead of building roads for timber harvest.**

**Response:** Wood and other types of biomass can be used as renewable energy. Therefore, in a sense, when a road is necessary for forest management, we are investing in renewable energy. However, since there is currently limited demand in the region for fuelwood, very little of the timber harvested from the Daniel Boone National Forest is used for fuelwood. Investment in other types of renewable energy is beyond the scope of the Revised Forest Plan.

## Social and Economic Values

**756. Public Concern: The Forest Service should develop a forest plan that benefits the American public.**

**Response:** That is the intent of the Revised Forest Plan. The Record of Decision includes the rationale for the Regional Forester's decision and why he believes his decision is in the public interest.

**757. Public Concern: The Forest Service should use reliable data and all available information and conduct valid economic analysis using valid methods, and disclose all information.**

**Response:** Additional information has been added to the socioeconomic section in Chapter 3 of the FEIS and the socioeconomic section of Appendix B of the FEIS. Appendix B gives a general overview of how the economic impacts were modeled. More detailed information on the modeling is in the process records. The Forest Service has chosen not to use values based on questionable and controversial methodologies and values not specifically required by Forest Service directives.

**758. Public Concern: The Forest Service should eliminate Goal 8.1, "Emphasize utilization based on market conditions."**

**Response:** Although not always possible, there are times when it is feasible to respond to market conditions and every effort should be made to take advantage of the opportunity so that revenues can be maximized.

**759. Public Concern: The Forest Service should clarify the “substitution effect,” “associated jobs,” and “induced jobs” used in the IMPLAN model. The Forest Service should disclose details of input-output analysis, and how income and employment multipliers were determined. The Forest Service should acknowledge the limitations of the IMPLAN model. The Forest Service should analyze how the local economy can supply the timber that the forest now provides. The Forest Service should analyze the economic benefits of the ecosystem benefits provided by intact forests.**

**Response:** Additional information has been added to the socioeconomic section in Chapter 3 of the FEIS and the socioeconomic section of Appendix B of the FEIS. Appendix B gives a general overview of how the economic impacts were modeled. More detailed information on the modeling is in the process records. All models at this level of analysis are used to compare the relative differences in alternatives.

**760. Public Concern: The Forest Service should analyze and disclose how much money is generated by each recreation activity and all other forest activities, across alternatives and in aggregate.**

**Response:** Additional information has been added to the socioeconomic section in Chapter 3 of the FEIS and the socioeconomic section of Appendix B of the FEIS. Appendix B gives a general overview of how the economic impacts were modeled. More detailed information on the modeling is in the process records, which are available for inspection upon request. You will find in the process records that recreation activities were considered separately and then aggregated to develop a programmatic analysis.

**761. Public Concern: The Forest Service should increase the payment in lieu of taxes that Kentucky counties receive.**

**Response:** This is outside of the scope of the Revised Forest Plan. Congress determines such payments.

**762. Public Concern: The Forest Service should manage forest resources in a manner that generates the most employment and profit.**

**Response:** The rationale for the Selected Alternative is documented in the Record of Decision. This rationale explains how the selected alternative maximizes “net public benefits,” which is not to be confused with “present net value.” “Net public benefits” includes considering those benefits and costs that cannot be quantified.

**763. Public Concern: The Forest Service should educate the public on the financial losses incurred by timber sales, and the fact that most forest jobs are in the recreation field. The Forest Service should demonstrate that timbers sales are not below-cost activities, rather, the revenue is used to finance unfunded land ownership costs and provides other benefits.**

**Response:** The Revised Forest Plan provides for the use of commercial timber sales as a tool to achieve and maintain desired future conditions for forest vegetation. Consequently, the purpose and need for timber sale projects will reflect a net benefit to the public and ecosystems.

**764. Public Concern: The Forest Service should demonstrate that the public is better off economically with timber harvest than without, and compare the value of Forest land as timber to the value of intact ecosystems.**

**Response:** Alternatives C and C-1 (the preferred alternative) emphasize providing for the sustainability of forest ecosystems. The intent is to maintain a variety of habitat components making up functioning ecosystems. Doing so can require vegetation management activities, including timber harvest. Timber harvesting will be used when it is determined to be the most effective and the most cost efficient method to achieve the desired results. We believe that functioning ecosystems are socially and economically valuable, and worth the vegetation management costs.

**765. Public Concern: The Forest Service should conduct an economic efficiency analysis rather than a cost effectiveness analysis.**

**Response:** Additional information has been added to the socioeconomic section in Chapter 3 of the FEIS and the socioeconomic section of Appendix B of the FEIS. Appendix B gives a general overview of how the economic impacts were modeled. More detailed information on the modeling is in the process records. The rationale for the selected alternative is documented in the Record of Decision. This rationale explains how the selected alternative maximizes “net public benefits” which is not to be confused with “present net value.” “Net public benefits” includes considering those benefits and costs that cannot be quantified.

**766. Public Concern: The Forest Service should conduct a benefit/cost analysis of ending timber harvest on Forest land and account for real prices, costs, and non-consumptive values.**

**Response:** Additional information has been added to the socioeconomic section in Chapter 3 of the FEIS and the socioeconomic section of Appendix B of the FEIS. Appendix B gives a general overview of how the economic impacts were modeled. More detailed information on the modeling is in the process records. Timber sales, when needed, provide a net benefit to the public and ecosystems. Because it is a tool used to attain the desired future condition, the economics and results are described as part of a project analysis.

**767. Public Concern: The Forest Service should not subsidize industry activities on Forest land.**

**Response:** This concern is outside the scope of the Revised Forest Plan. Commercial activities conducted on the national forests by industries or other private enterprises are conducted under stringent contractual controls established by the agency.